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DIVISION OF FISHERIES REHABILITATION,  
ENHANCEMENT AND DEVELOPMENT (FRED)

Edited by  
John C. McMullen  
and  
Mark W. Kissel

State of Alaska  
Alaska Department of Fish and Game  
Division of FRED

Jay S. Hammond  
Governor

Ronald O. Skoog  
Commissioner

Robert S. Roys  
Director

Box 3-2000  
Juneau, Alaska 99801

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## DIRECTOR'S FORWARD

In the ten years since FRED Division was created by the Alaska Legislature, a modern and technologically advanced aquaculture program has taken root in the state. That program is not limited to FRED, but includes private nonprofit hatcheries, regional aquaculture associations, and cooperative projects with other governmental agencies and divisions.

This entire aquaculture complex is beginning to fulfill the expectations of the Legislature and the voters who supported four bond issues over the last ten years for hatchery construction. Numbers of returning hatchery salmon, in the tens of thousands a few years ago, are now in the millions. Hatcheries are beginning to have a significant effect on the state's fisheries, even though most hatcheries in the state are not yet operating at full capacity. Certainly, it seems reasonable to continue the development of the hatchery program to its full potential.

However, the future of the program is not entirely secure. Spending limitations may prevent hatcheries that are already built from operating at full capacity. Hatcheries are like machines in this respect: the more they are used, the more value they produce. In addition, the exceptional natural production of the past two years makes aquaculture seem less important today than it did ten years ago. After all, why operate hatcheries when the wild stocks are producing harvests of more than 100 million fish? The answer, of course, is that fish production cannot be turned off during good years and on during the bad; FRED deals mainly with salmon, species that have life cycles ranging from two to seven years. Indeed, the best time to prepare for the low production cycles is during high cycles when sufficient brood fish are available. Then when the natural production fails, as it does periodically, artificial production will bolster the industry.

FRED is also making a major commitment to sport fisheries in and around the population centers of the state. Reconstruction of the hatchery at Fort Richardson and research into production of grayling, sheefish, and Dolly Varden char are already underway. One of FRED's primary goals of the next year is the establishment of a viable rainbow trout brood stock for the Fort Richardson and Clear AFS Hatcheries. The increased production that we expect from these projects will not only provide good sport fishing for Alaskans, but will aid tourism as well.

In addition to hatcheries, the division is involved in habitat alteration and improvement work, fishway construction, fish stock transplants, environmental assessments, and department-wide engineering support. However, the bulk of FRED's budget is devoted to hatcheries. FRED provides, for example, fish genetics, pathology, and limnology services for the private sector, and oversees the rational development of aquaculture in the state.

A lot has been achieved in the last ten years, and yet the potential for aquaculture in Alaska is so vast that it is only a beginning. With continued public support, the next decade will witness the improvement and expansion of Alaskan aquaculture, creating a more stable fishing industry and a strong economic sector based on a valuable renewable resource.

--Robert S. Roys



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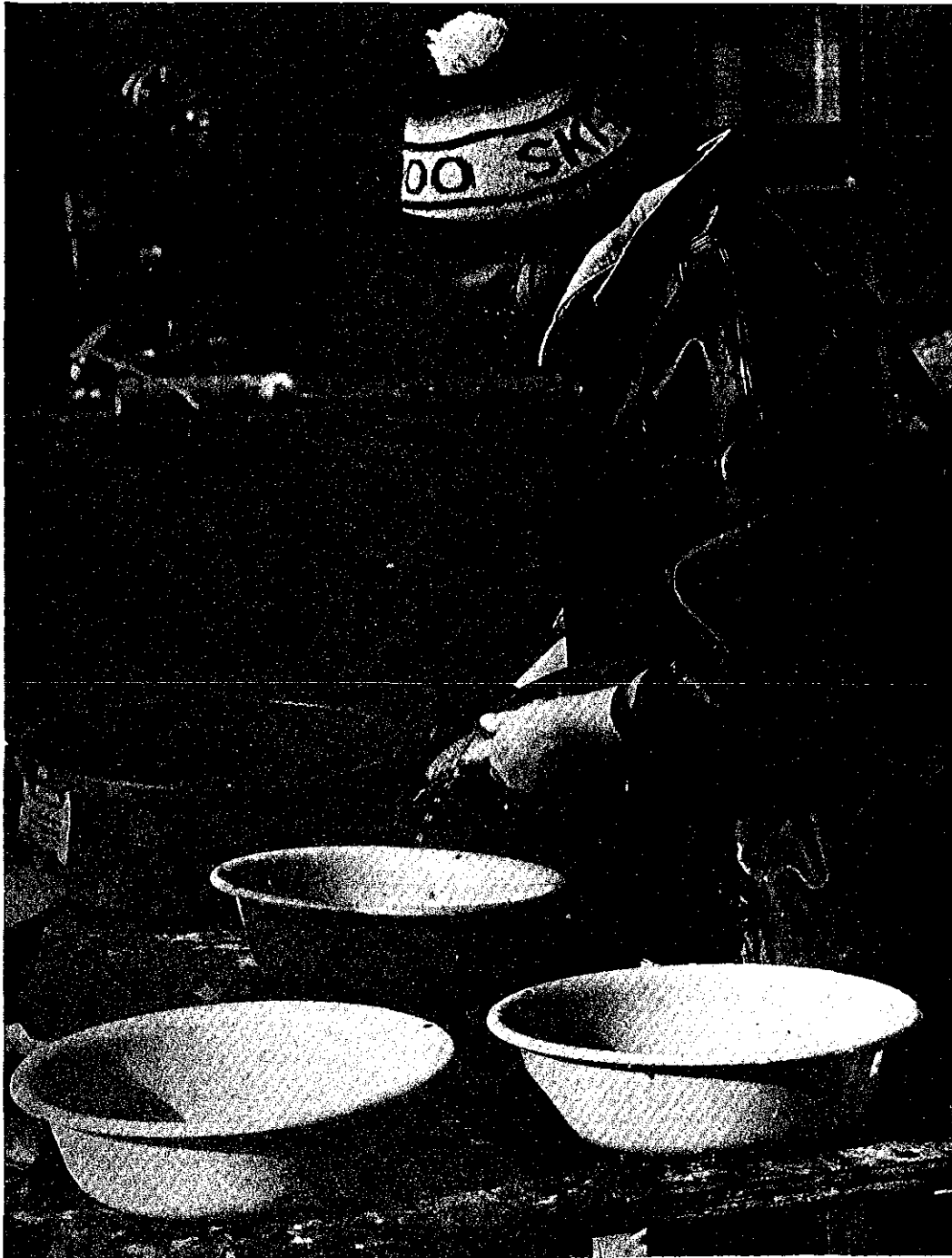
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A FRED fish culturist spawns female rainbow trout at the Ship Creek Hatchery Complex at Fort Richardson. The Fort Richardson facility is being reconstructed to provide a better environment for rainbow eggs, juveniles, and brood stock. (ADF&G photo by Mark Kissel)

## 1981 FRED PRODUCTION REPORT

### Adult Salmon Returns

More than 2 million salmon released from Alaska Department of Fish and Game hatcheries returned as adults during 1981 (Table 1). This number is a low estimate because the catch of hatchery fish cannot be evaluated in all fisheries without considerable cost. This return was, however, more than double last year's return of approximately 880,000. A comparison of adult returns of hatchery-bred fish over the past seven years is in Figure 1.

Hatchery-bred fish passed through many of the state's fisheries, where the majority were caught by commercial and sport fisherman. Of the total adult return of 2,008,060 salmon, 86.6% (1,739,770) were harvested. Approximately 268,000 returning hatchery fish were either used in hatchery egg takes or allowed to spawn naturally.

The leading producer of adult fish during 1981 was the Tutka Bay Lagoon Hatchery near Homer. An estimated 1.02 million pink salmon returned as a result of hatchery releases at Tutka the previous year. Ocean survivals of released pink salmon juveniles were far above expectations. Many young pink salmon were fed and protected in saltwater rearing pens in Tutka Bay Lagoon for about 40 days after emerging from the incubators. Marine survival for these fish was approximately 15.6%. Other hatchery-produced fry that were released upon emergence survived at a lower but still impressive rate of 6.7%. By comparison, the marine survival of wild pink salmon fry from Tutka Creek was 4.7%. The combination of rearing pink salmon fry and releasing them when plankton blooms are at their peak has, in this case, led to marine survivals three times greater than wild fry.

The effect of the Tutka Hatchery on the pink salmon fishery of Lower Cook Inlet is significant. Tutka Hatchery fish comprised 29% of the entire Lower Cook Inlet pink harvest, 67% of the Southern District harvest, and 94% of the Tutka Bay Subdistrict harvest. Large returns of hatchery fish to the Tutka area also fueled a major sport fishery in which at least 5,600 fish were taken.

Another leader in adult returns was the Kitoi Bay Hatchery on Afognak Island near Kodiak. More than 797,000 pink salmon returned, and at least 663,000 were taken in commercial fisheries near the hatchery. Marine survival ranged from 3.1% for young pink salmon released without rearing, to 6.4% for those that were reared. Biologists estimated that the Kitoi Hatchery pinks comprised about 58% of the commercial catch in the fisheries they sampled.

The return of sockeye salmon to the Big Lake Hatchery near Wasilla was more than 43,000, with an additional 40,000 hatchery sockeyes taken in the commercial fisheries of Cook Inlet.

Returns of hatchery-bred coho salmon were poor in the Cook Inlet and Prince William Sound fisheries in 1981. An unexpected die-off of adult coho brood stock at Seward in 1979 resulted in a shortage of eggs for the Ship Creek Hatchery Complex in Anchorage. FRED attempted to make up for this shortage by accelerating the growth of 1980 brood year cohos by rearing them in warm water with additional feed. The fish released in 1980 were a year younger than those normally released from state hatcheries. These so-called "zero-age" smolts, however, did not survive well in the ocean, resulting in poor returns to Seward, Whittier, and Homer.

Sport fishermen in Halibut Cove Lagoon near Homer caught an estimated 689 king salmon of the 800 that returned to the terminal saltwater fishery there. In the same area, sportsmen took 1,500 sockeye salmon returning to Leisure Lake, which had been stocked with sockeye salmon from the Crooked Creek Hatchery at Kasilof. Commercial fishermen netted another 10,000 of these returning sockeyes.

Table 1 omits most sport catch figures for the Southeast region of the state. These numbers have not yet been calculated except for the Crystal Lake king salmon taken in the Juneau sport fisheries. In addition, catches of hatchery-bred rainbow trout, grayling, and coho salmon that were stocked in land-locked lakes and interior streams are not counted as returns, and are not reflected in Table 1.

Whenever possible, the carcasses of adult salmon spawned by hatchery personnel are sold to processors or given away to local people. In Southeast Alaska, for example, more than 30 tons of king, coho, and chum salmon were given away for personal use in 1981. At the Kitoi Bay Hatchery near Kodiak, about 60 tons of spawned-out pink salmon were sold to an entrepreneur, who resold it in Kodiak for uses such as crab bait. The State received from \$.05 to \$.07 per pound for these carcasses, which would otherwise have been dumped back into Kitoi Bay.

#### Projected 1982 Returns

About 2.3 million hatchery-bred adult salmon are expected to return to the fisheries and facilities during 1982 (Table 2). The projected returns listed in the table are based on standard assumptions of ocean survivals, except in cases where several years of actual data are available. The projections for Tutka Bay and Kitoi Bay Hatcheries, for example, are based on actual return data.

A significant increase in returns of chum salmon is expected in the Southeast region, specifically at the Hidden Falls Hatchery on Baranof Island and the Beaver Falls Hatchery in Ketchikan. FRED plans to use most of the returning chums for brood stock.

Sockeye salmon returns to the Big Lake Hatchery near Wasilla will be zero in 1982 because of a disease problem there in 1980. Infectious Hematopoietic Necrosis (IHN) wiped out that year's sockeye salmon brood in the hatchery. The hatchery has been disinfected and strict disease control procedures have been initiated. The disease did not recur during 1981.

### Fish Releases

During 1981, FRED released more than 130 million young salmon, more than two-and-a-half times its 1980 production (Table 3). Pink salmon comprised 48.2% of the 1981 production, down from 61% in 1980. This reflects the buildup of chum and sockeye salmon brood stocks throughout the state. Pink salmon releases in 1981 totaled 62.7 million fry and fingerlings.

Chum salmon releases increased to 39.4 million young fish, which will boost brood stock development in another three years. Sockeye salmon production is back on line after encountering problems with disease in the previous two years. About 25.2 million young sockeye salmon were released in 1981. This does not include the 3 million eyed sockeye salmon eggs that are being planted in the Upper Thumb River on Kodiak Island. Figure 2 compares the numbers of fish released by FRED from 1974 through 1981.

Approximately 532,000 rainbow trout juveniles were stocked in landlocked lakes in the Anchorage and Fairbanks areas in 1981 (Table 4). This number was, however, insufficient to meet the needs of the Sport Fish stocking program. FRED is committed to getting the rainbow trout program back on line in one year. A major factor will be the reconstruction of the Ship Creek Hatchery Complex on Fort Richardson, which should be completed in 1982. This will allow a fourfold increase in the production of sport fish there. The cultivation of an adequate brood stock is a FRED priority.

The production of steelhead trout, grayling, and sheefish (Table 4) was essentially investigative in 1981. Steelhead were planted in roadside streams in the vicinities of the Klawock and Deer Mountain Hatcheries. The state's grayling and sheefish research projects were transferred from the Ship Creek Complex to Clear Hatchery. There, fish culturists were successful in rearing production-sized lots of sheefish. Rearing experiments with grayling were not as successful, although more than 400,000 grayling fry were produced and released.

### Hatchery Production Summaries

FRED seeks the highest possible survival of eggs and fry in its hatcheries while at the same time producing quality fish that will survive well in the wild. Standard egg and fish survivals have been set by the FRED Division, and data in Tables 5 through 17 compare actual survivals within FRED hatcheries with these standards. These data provide a record of each brood stock used in FRED hatcheries and a basis for evaluating and improving hatchery procedures.

In summary, the data reveal that overall survivals from green egg to release increased during the 1980-81 season for four of the five salmon species. Pink salmon survivals increased from 73% for fish released in 1980 to 78.2% for fish released in 1981; chum salmon survivals jumped from 61% to 77.6%, and king salmon survivals increased from 55.3% to 65.2%.

Sockeye salmon survivals, which were a poor 42% in 1980 because of disease outbreaks, increased to 76.5% in 1981. The only decrease was among coho salmon, where survivals dropped from 78.4% in 1980 to 61.1% in 1981. This low survival was due to several factors including disease, a power outage, and gas supersaturation. It should be noted, however, that even the lowest of the 1981 survival percentages is at least six times greater than the average survival of naturally spawned and incubated eggs and fish.

In general, king salmon survived well in state hatcheries in 1981 (Tables 5 and 6). Smolts released from the Ship Creek Hatchery at Anchorage were taken as eggs the previous year. Their rapid growth is due to rearing in heated water.

King salmon in Southeastern hatcheries are reared at ambient water temperatures, and so do not become smolts until their second year. Survival to the smolt stage at Southeastern hatcheries appears to be lower than desired, but the range of 59-84% accounts for overall survival from the emergent fry stage rather than fingerling to smolt.

Coho salmon (Tables 7 and 8) are released from state hatcheries as fry, fingerlings, or smolts. The Big Lake Hatchery is engaged in a successful coho rehabilitation project using hatchery fry. The Ship Creek Hatchery released coho smolts within one year of the date they were taken as eggs. This "zero-age" smolt program will not be continued because ocean survival of these fish has been poor. Coho fingerlings at the Snettisham Hatchery near Juneau sustained high mortality; the causative agent has yet to be confirmed.

Sockeye salmon are produced only in the state's Central Region hatcheries. Eggs and fish survived well in 1980-81 (Table 9), following serious IHN virus mortalities of emergent fry the previous two production years. The Crooked Creek and Gulkana Hatcheries are the only Alaska sockeye hatcheries that have never suffered an IHN outbreak. A mortality of one million eggs at Crooked Creek in 1980 was caused by air in an incubator, which restricted water flow.

Chum salmon incubation and rearing procedures are well understood by state hatchery operators. Most chum salmon hatcheries are building brood stock and are receiving eggs from remote locations. Egg survivals at some of these hatcheries are below performance standards (Tables 10 and 11), mostly because of the extra handling involved in remote egg takes. These egg survivals are expected to improve when adult salmon begin returning to the hatcheries in large numbers, eliminating the need for remote egg takes.

Incubation and rearing methods for pink salmon are as well known as those for chums. Tutka Bay Hatchery, which is a proven pink salmon producer, continued to have problems with egg survivals in 1980 (Table 12). Fish culturists there are attempting to refine egg take procedures to increase egg survivals. Changes in 1981 led to somewhat higher survivals, but additional improvements will be necessary.

The state's four other pink salmon hatcheries met their survival performance indicators in 1981 (Tables 12 and 13), and the Klawock Hatchery surpassed those indicators during the first year that pink salmon were handled there.

Most rainbow trout incubated and reared at state hatcheries (Table 14 and 15) supply landlocked lake fisheries in Central and Interior Alaska. The Ship Creek Hatchery houses the major rainbow trout program. Survivals of eggs and fry have been erratic because this hatchery complex was not designed to provide the environmental control necessary for rainbow trout culture. The hatchery at Fort Richardson is being reconstructed to accommodate a rainbow trout brood stock. Steelhead trout were reared at the Deer Mountain and Klawock Hatcheries in Southeastern. Those releases were experimental. The project was hampered by acts of vandalism at the Deer Mountain Hatchery in Ketchikan.

The State's only grayling culture occurs at the Clear Air Force Station Hatchery, near Anderson (Table 16). This project is experimental, and will grow in size when our ability to feed and rear grayling is improved.

Sheefish were incubated and reared at the Clear AFS Hatchery for the first time in 1981 (Table 17). The juveniles are extremely delicate, and their culture and rearing are still being refined

#### Egg Takes

During 1981, FRED took more than 225 million fish eggs for incubation (Table 18). This was 54 million eggs more than were taken the year before, but 48 million below the revised Fiscal Year 1982 egg take goal of 273.4 million. At the same time, it was more eggs than FRED had ever taken before. Salmon egg takes from 1974 through 1981 are compared in Figure 3.

Leading state hatcheries in eggs taken was the Kitoi Bay Hatchery with more than 70 million pink salmon eggs. Crews from the Snettisham Hatchery near Juneau took more than 13 million chum, coho, and king salmon eggs, a big step forward in brood stock development for this new hatchery. The hatcheries at Deer Mountain, Gulkana River, Clear AFS, Crooked Creek, Kitoi Bay, and Tutka Bay are now operating at full capacity. The capacities of several of these hatcheries, however, may be expanded in the near future.

Table 18 also lists the numbers of fish killed to take eggs and the numbers allowed to spawn naturally. The data show that millions of eggs can be taken using a relatively small number of adult spawners. For example, 6,204 adult chum salmon from the Neka River provided the Snettisham Hatchery with more than 10 million fertilized eggs. Hatchery brood stock is removed from natural spawning stocks according to a prearranged agreement with the Division of Commercial Fisheries of the Alaska Department of Fish and Game (ADF&G).

As in previous years, pink salmon provided the bulk of eggs for state hatcheries. About 111 million pink salmon eggs were taken, compared with about 55 million chum salmon eggs. State hatcheries took nearly 48 million sockeye salmon eggs, which places Alaska as the world leader in hatchery production of sockeye.

FRED anticipates that 2.8 million adult salmon will result from eggs taken in 1981 (Table 19). These adults will return over the course of several years beginning in 1983. Chum salmon, for example, return as three, four, and five-year-olds, so 1981 brood year chums will return to the fisheries from 1984 to 1986. The projections in Table 19 are based on standard assumptions of ocean survival rates, except where several years of actual return data are available.

The return of adult king salmon as a result of 1981 egg takes in Southeastern is projected to reach the regional objective set forth in the state's salmon plan (Alaska Salmon Fisheries Plan, 1975, State of Alaska). The projection of 37,000 adults, however, represents less than half of the state's present production capability for this species. King salmon production will increase as brood stocks are developed at the Snettisham and Hidden Falls Hatcheries.

The numbers of eggs incubated at state hatcheries will continue to increase as brood stocks are developed. Egg takes planned for 1982 are listed in Table 20. The plan to take 363 million fish eggs assumes that brood stocks will be available in the expected numbers.

Egg takes for rainbow trout are dependent on the completion of the Ship Creek Hatchery reconstruction project. The development of a second rainbow trout project in the Interior at Clear AFS Hatchery is dependent on the construction of additional trout rearing and holding facilities there. Special emphasis is being placed on the need for rainbow trout. Grayling and sheefish production will be expanded also as culture methods, especially rearing techniques, are developed for these species.



Table 1. Estimates of the numbers of salmon, produced at FRED hatcheries, that returned as adults to the fisheries and facilities in 1981.

Hatchery or project	Species	Commercial catch	Sport catch	Brood stock/ escapement	Total
SOUTHEAST REGION					
Beaver Falls	chum	758	...	4,995	5,753
Crystal Lake	king	1,861	34	981	2,876
	coho	140	...	420	560
Deer Mtn.	king	33	...	272	305
	coho	349	...	217	566
Hidden Falls	chum	...	...	3,436	3,436
Klawock	coho	401	...	90	491
Snettisham	coho	155	...	200	355
	chum	...	...	1,059	1,059
REGIONAL SUBTOTALS:		3,697	34	11,670	15,401

-Continued-

Table 1. Continued.

Hatchery or project	Species	Commercial catch	Sport catch	Brood stock/ escapement	Total
CENTRAL REGION					
Big Lake	coho	1,814	368	842	3,024
	sockeye	40,927	292	43,209	84,428
Cannery Creek	pink	47,017	...	22,669	69,686
Hobo Creek	pink	...	...	7,000	7,000
Crooked Creek	sockeye	10,310	1,500	0	11,810
Leisure Lake					
East Creek	sockeye	...	...	556	556
Kitoi Bay	pink	663,414	...	134,022	797,436
Ship Creek Complex					
Fritz Creek	coho	...	50	0	50
Halibut Cove	king	100	689	0	800
	coho	...	...	...	...
Crooked Creek	king	5	454	1,032	1,491

-Continued-

Table 1. Continued.

Hatchery or project	Species	Commercial catch	Sport catch	Brood stock/ escapement	Total
Whittier	coho	...	9	...	9
Seward	coho	...	100	...	100
Tutka Bay	pink	963,349	5,640	46,999	1,015,988
Paint River	pink	1	...	280	281
REGIONAL SUBTOTALS:		1,726,937	9,102	256,609	1,992,659
STATE TOTALS:		1,730,634	9,136	268,279	2,008,060

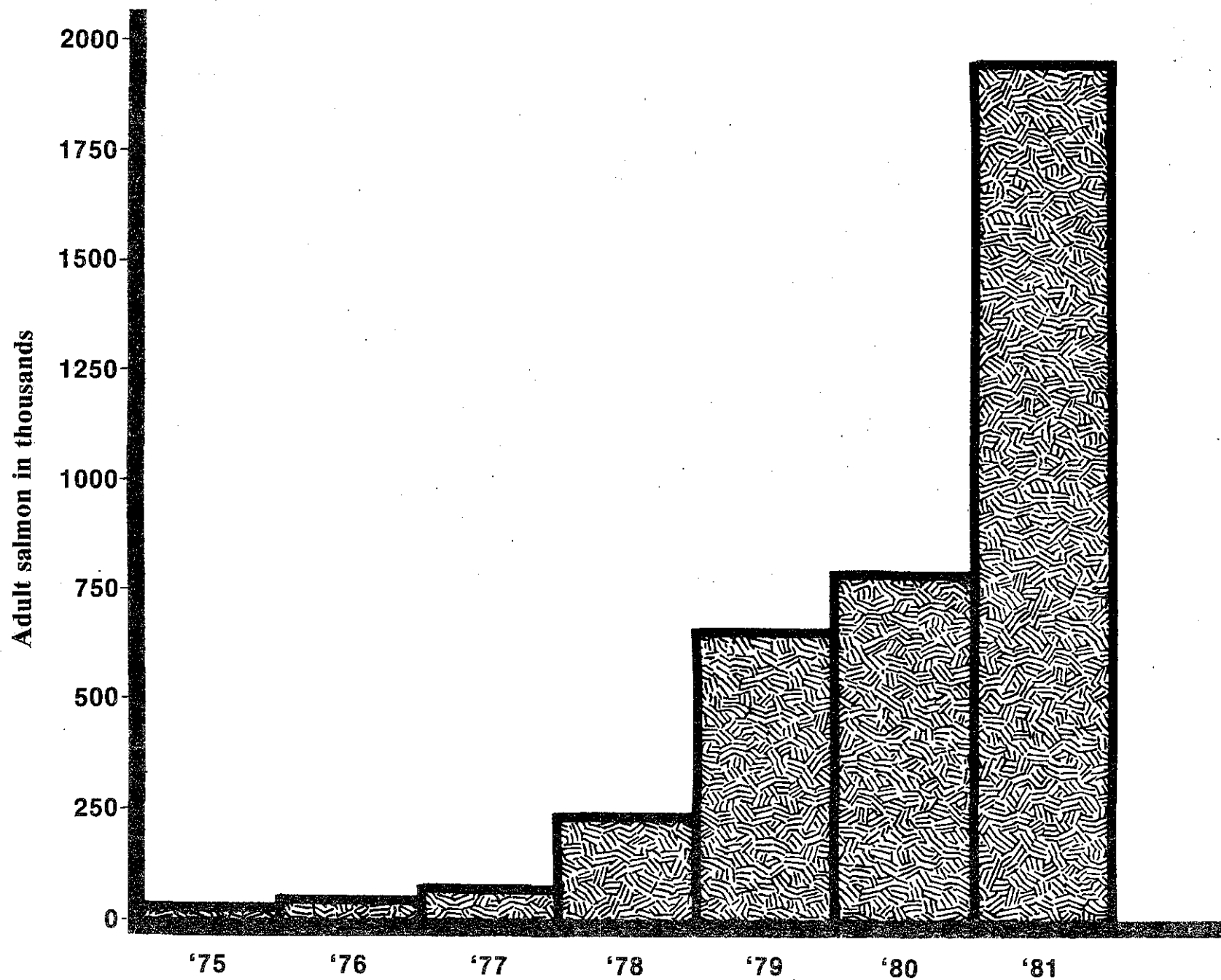


Figure 1. Numbers of salmon produced at FRED hatcheries that returned as adults to the hatcheries and fisheries from 1975 through 1981.

Table 2. A projection of the number of hatchery-bred salmon expected to return to FRED hatcheries and projects in 1982.

Return site	Numbers by species				
	King	Coho	Sockeye	Chum	Pink
SOUTHEAST REGION					
Beaver Falls	--	--	--	15,350	--
Crystal Lake	470	47,691	--	--	--
Deer Mountain	1,477	6,755	--	--	--
Hidden Falls	--	--	--	34,464	--
Klawock	--	--	--	--	6,791
Ohmer Creek	--	6,990	--	--	--
Snettisham	274	989	--	2,933	--
REGIONAL TOTALS:	2,221	62,425	0	52,747	6,791
CENTRAL REGION					
Big Lake	--	1,100	--	--	--
Cannery Creek	--	--	--	--	560,000
Clear	--	--	--	1,000	--
Crooked Creek	2,193	--	--	--	--
East Creek	--	--	14,000	--	--
Fritz Creek	--	1,080	--	--	--
Halibut Cove Lagoon	1,350	--	--	--	--
Hobo Creek	--	--	--	--	16,000
Kitoi Bay	--	--	--	--	738,000
Leisure Lake	--	--	1,080	--	--
Main Bay	--	--	--	--	14,500
Paint River	--	--	--	--	2,800
Russell Creek	--	--	--	20,000	--
Tustumena	--	--	14,000	--	--
Tutka	--	--	--	--	700,000
Whittier	--	3,000	--	--	--
Seward	--	10,000	--	--	--
REGIONAL TOTALS:	3,543	15,180	29,080	21,000	2,031,300
STATE TOTALS:	5,764	77,605	29,080	73,747	2,038,091
GRAND TOTAL: 2,224,287					

Table 3. Numbers of salmon released during 1981 that were produced at FRED hatcheries.

Hatchery	Brood year, Stock, Species	Number of salmon released
CENTRAL REGION		
Big Lake	1980 Fish Creek, coho	482,618
	1980 Fish Creek, sockeye	3,570,020
	1980 Meadow Creek, sockeye	395,242
	1980 Nancy Lake, sockeye	736,749
Cannery Creek	1980 Eaglek, chum	1,963,657
	1980 Siwash Creek, chum	484,594
	1980 Cannery Creek, pink	14,388,752
	1980 Port San Juan, pink	6,950,000
Clear AFS	1980 Bluff Cabin Slough and Delta River, chum	314,000
Crooked Creek	1980 Glacier Flat, sockeye	5,032,586
	1980 Bear Creek, sockeye	6,012,476
East Creek	1980 East Creek, sockeye	2,555,712
	1980 Francis Creek, sockeye	1,699,600
	1980 Killian Creek, sockeye	27,825
Gulkana	1980 Gulkana River, sockeye	5,200,000
Kitoi Bay	1980 Chignik, king	134,784
	1980 Sturgeon River, chum	36,735
	1980 Big Kitoi Creek, pink	26,245,143
Russell Creek	1980 Russell Creek, chum	10,700,000
	1980 Russell Creek, pink	3,740,863
Ship Creek Complex	1980 Crooked Creek, king	414,797
	1980 Ship Creek, king	45,445
	1980 Bear Creek, coho	1,340,900
Tutka Bay	1980 Tutka, chum	8,679
	1980 Tutka, pink	<u>10,357,850</u>

CENTRAL REGION TOTAL: 102,839,027

-Continued-

Table 3. Continued.

Hatchery	Brood Year, Stock, Species	Number of salmon released
SOUTHEAST REGION		
Beaver Falls	1980 Beaver Falls and Disappearance Creek, chum	11,454,276
Crystal Lake	1979 Duncan Salt Chuck, coho	22,211
	1979 Crystal Creek, coho	546,806
	1979 Andrews Creek, king	42,197
	1980 Crystal Creek, chum	12,802
Deer Mountain	1979 Cripple Creek, king	65,743
	1979 Ketchikan Creek, coho	67,548
Hidden Falls	1980 Kadashan Bay, chum	8,896,429
	1980 Seal Bay, chum	117,509
Klawock	1979 Klawock River, coho	36,537
	1980 Klawock River, chum	3,364,456
	1980 Klawock River, pink	970,074
Snettisham	1979 King Salmon River, king	26,746
	1979 Speel Lake, coho	98,980
	1980 Neka River and Snettisham, chum	<u>2,043,258</u>
SOUTHEAST REGION TOTAL:		27,765,572
SPECIES TOTALS		
	King:	729,712
	Coho:	2,595,600
	Sockeye:	25,230,210
	Chum:	39,396,395
	Pink:	<u>62,652,682</u>
TOTAL SALMON RELEASE:		130,604,599

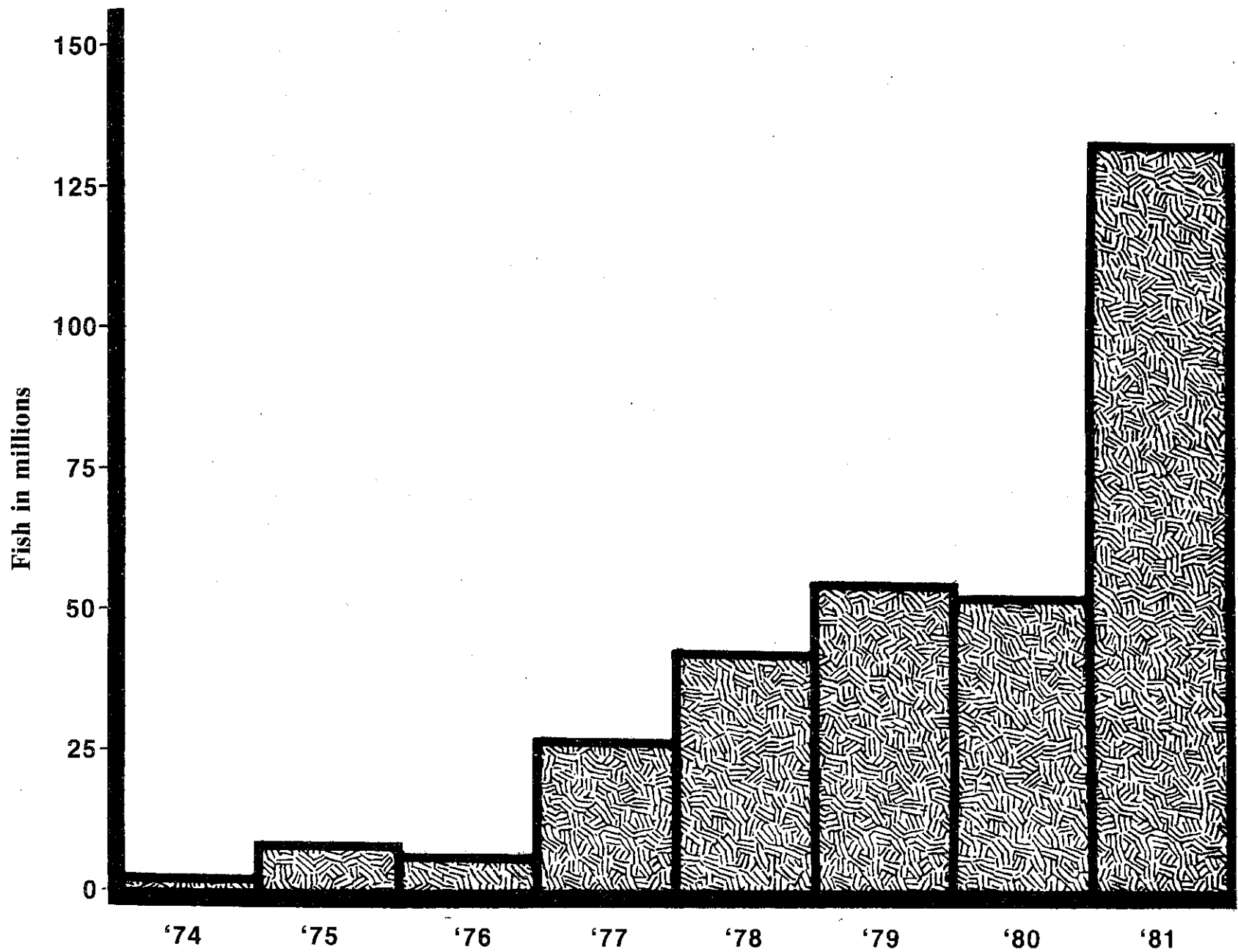


Figure 2. Numbers of young fish released by FRED from 1974 through 1981.



Table 4. Numbers of rainbow trout, steelhead trout, grayling, and sheefish planted by FRED during 1981.

Species	Brood stock	Size	Number planted	Location planted
Rainbow trout	1980 Swanson (wild)	fingerling	2,830	Anchorage and Fairbanks areas
		10g/fish	12,775	
	1980 Swanson (dom)	fingerling	271,300	
		10g/fish	102,600	
	1981 Talarik	fingerling	5,000	
	1981 Swanson (dom)	fingerling	<u>138,000</u>	
		Rainbow Total:	532,505	
Steelhead trout	1978 Ketchikan Creek	smolt	2,816	Ward Creek Ketchikan Creek Klawock River
	1979 Ketchikan Creek	smolt	1,146	
	1980 Klawock River	smolt	<u>6,422</u>	
		Steelhead Total:	10,384	
Grayling	1981 Jay Lake	fry	45,224	Fairbanks area
	1981 Junction Lake	fry	<u>377,098</u>	
		Grayling Total:	422,322	
Sheefish	1980 Koyukuk	fry	86,639	Interior
		fingerling	<u>17,642</u>	
		Sheefish Total:	104,281	

Table 5. Summary of king salmon production from Central Region FRED Division facilities showing survivals in those stocks from which fish were released during 1981.

Facility	Brood year, Brood stock	Number produced/(Actual percent survivals from previous stage to this stage)					
		Green eggs	Eyed eggs (90%)	Emergent (95%)	Fry (95%)	Fingerlings (90%)	Smolts (80%)
		(Percent survival goals from previous stage to this stage)					
Ship Creek	1980 Crooked Creek	533,350	450,500 (84%)	437,300 (97%)	433,700 (99%)	431,900 (99.6%)	414,797 <sup>a/</sup> (96%)
	1980 Ship Creek	60,000	53,100 (89%)	47,300 (89%)	47,141 (99.6%)	47,098 (99.9%)	45,445 <sup>b/</sup> (96.5%)
Kitoi	1980 Chignik	158,542	139,404 (88%)	135,398 (97%)	134,784 <sup>c/</sup> (99%)		

<sup>a/</sup> Released 203,724 at Crooked Creek, 101,223 at Halibut Cove Lagoon, and 109,850 at Whittier.

<sup>b/</sup> Released in local Anchorage lakes.

<sup>c/</sup> Released in Rose Tead Lake.

Table 6. Summary of king salmon production from Southeast Region FRED Division facilities showing survivals in those stocks from which fish were released during 1981.

Facility	Brood year, Brood stock	Number produced/(Actual percent survivals from previous stage to this stage)					
		Green eggs	Eyed eggs	Emergent	Fry	Fingerlings	Smolts
			(90%)	(95%)	(95%)	(95%)	(80%)
(Percent survival goals from previous stage to this stage)							
Deer Mt.	1979 Cripple Creek	204,000	160,000 <sup>a/</sup> (78%)	130,298 (81%)		65,743 <sup>b/</sup> (59%) <sup>c/</sup>	
Crystal L.	1979 Andrews Creek	149,693	82,763 (55%) <sup>d/</sup>	78,941 (95%)		55,873 <sup>e/</sup> (71%)	
Snettisham	1979 King Salmon River	35,318	32,509 (92%)	31,786 (98%)		26,746 <sup>b/</sup> (84%)	

<sup>a/</sup> Poor survival probably due to inability to treat eggs for fungus because of recirculating water chiller system. It was inadvisable at the time to switch to alternate water supply because of extremely high water temperatures encountered that year.

<sup>b/</sup> Released.

<sup>c/</sup> Mortality caused by furunculosis, tank overflow, and possible poaching.

<sup>d/</sup> Mortality probably due to high incidence of white spot disease.

<sup>e/</sup> Released 42,197. 13,676 others were released in 1980.

Table 7. Summary of coho salmon production from Central Region FRED Division facilities showing survivals in those stocks from which fish were released during 1981.

Facility	Brood year, Brood stock	Number produced/(Actual percent survivals from previous stage to this stage)					Smolts (80%)
		Green eggs	Eyed eggs (90%) (Percent survival goals from previous stage to this stage)	Emergent (95%)	Fry (95%)	Fingerlings (90%)	
Big Lake	1980 Fish Creek	568,550	522,669 (92%)	499,338 (96%)	482,618 <sup>a/</sup> (97%)		
Ship Creek Complex	1980 Bear Creek						
	0-age smolt program	824,800	775,300 (94%)	752,500 (97%)	564,000 <sup>b/</sup> (75%)	475,000 (84%)	419,000 <sup>a/</sup> (88%)
	fingerling program	649,800	609,000 (94%)	597,000 (98%)	585,000 (98%)	573,400 <sup>a/</sup> (98%)	
	1-age smolt program	909,400	881,000 (97%)	845,800 (96%)	820,400 (97%)	804,000 <sup>c/</sup> (98%)	

<sup>a/</sup> Released.

<sup>b/</sup> High mortality caused by nitrogen supersaturation in excess of 106%.

<sup>c/</sup> 348,500 released as fingerlings; 330,000 lost to disease, sea gull predation and pump siphoning during power outage.

Table 8. Summary of coho salmon production from Southeast Region FRED Division facilities showing survivals in those stocks from which fish were released during 1981.

Facility	Brood year, Brood stock	Number produced/(Actual percent survivals from previous stage to this stage)					
		Green eggs	Eyed eggs	Emergent	Fry	Fingerlings	Smolts
			(90%)	(95%)	(95%)	(95%)	(80%)
(Percent survival goals from previous stage to this stage)							
Deer Mt.	1979 Ketchikan Creek	144,130	128,407 (89%)	121,287 (95%)		67,548 <sup>a/</sup> (56%) <sup>b/</sup>	
Klawock	1979 Klawock River	76,257	50,296 (66%)	43,085 (86%)		36,537 <sup>a/</sup> (85%)	
Crystal L.	1979 Duncan Salt Chuck	146,037	83,607 (57%)	49,860 (60%)		22,211 <sup>c/</sup> (76%)	
	1979 Crystal Creek	848,644	735,719 (87%)	645,846 (88%)		546,806 <sup>d/</sup> (94%)	
Snettisham	1979 Speel Lake	201,200	191,256 <sup>e/</sup> (95%)	180,021 (94%)		98,980 <sup>a/</sup> (55%) <sup>f/</sup>	

<sup>a/</sup> Released.

<sup>b/</sup> Low survival due to furunculosis outbreak.

<sup>c/</sup> Released. Another 15,468 smolts were released in 1980.

<sup>d/</sup> Released. Another 57,119 smolts were released in 1980.

<sup>e/</sup> Number of alevins rather than eyed eggs.

<sup>f/</sup> High mortality attributed to an intestinal amoeba infection during the first two months of rearing.

Table 9. Summary of sockeye salmon production from Central Region FRED Division facilities showing survivals in those stocks from which fish were released during 1981.

Facility	Brood year, Brood stock	Number produced/(Actual percent survivals from previous stage to this stage)					
		Green eggs	Eyed eggs	Emergent	Fry	Fingerlings	Smolt
			(90%)	(95%)	(95%)	(90%)	(80%)
(Percent survival goals from previous stage to this stage)							
Crooked Creek	1980 Glacier Flat	6,364,400	6,031,872 (95%)	5,214,765 (86%)	5,214,765a/ (86%)		
	1980 Bear Creek	10,036,600	8,222,256b/ (82%)	6,216,400 (76%)	6,012,476a/ (96.7%)		
Big Lake	1980 Meadow Creek	522,199	425,094c/ (82%)	395,242a/ (93%)			
	1980 Fish Creek	4,252,630	3,687,741 (87%)	3,570,020a/ (97%)			
	1980 Nancy Lake	856,548	748,909 (87%)	736,749a/ (98%)			
East Creek	1980 East Creek	2,977,724	2,586,516 (87%)	2,555,712a/ (99%)			
	1980 Francis Creek	1,956,229	1,746,811 (89%)	1,699,600a/ (97%)			
	1980 Killian Creek	29,516	28,106 (95%)	27,825a/ (99%)			
Gulkana (Comm Fish/FRED project)	1980 Gulkana River	6,228,000		5,200,000a/ (83%)			
Karluk Lake	1981 Thumb River	4,200,000	3,400,000d/ (81%)				

<sup>a/</sup> Released.

<sup>b/</sup> Estimated loss of 1,083,816 caused by lack of incubator screens and air bubble problem.

<sup>c/</sup> Approximately 16% of loss caused by bubbles.

<sup>d/</sup> 3 million will be planted in late December as eyed eggs. The rest will be kept over winter in Karluk's stream-side incubators.

Table 10. Summary of chum salmon production from Central Region FRED Division facilities showing survivals in those stocks from which fish were released during 1981.

Facility	Brood year, Brood stock	Number produced/(Actual percent survivals from previous stage to this stage)				
		Green eggs	Eyed eggs	Emergent	Fry	Fingerlings
			(90%)	(95%)	(95%)	(90%)
(Percent survival goals from previous stage to this stage)						
Tutka Bay	1980 Tutka Creek and Tutka Lagoon	19,960	14,540 (73%)	10,125 (70%)	8,697 <sup>a</sup> / (86%)	
Kitoi Bay	1980 Sturgeon River	107,457	89,442 (83%)	37,014 (41%)	36,846 (99%)	36,735 <sup>a</sup> / (99%)
Russell Creek	1980 Russell Creek	13,872,000	12,119,500 (87%)		10,700,000 <sup>a</sup> / (96%)	
Cannery Creek	1980 Eaglek	2,607,115	2,047,609 (79%)	1,973,657 (96%)	1,963,657 <sup>a</sup> / (100%)	
	1980 Siwash	673,116	505,687 (75%)	484,908 (96%)	484,594 <sup>a</sup> / (99%)	
Clear AFS	1980 Bluff Cabin Slough	47,000	42,000 (89%)	332,800 (93%)	314,000 <sup>a</sup> / (94%)	
	1980 Delta River	354,400	315,400 (89%)			

<sup>a</sup>/ Released.

Table 11. Summary of chum salmon production from Southeast Region FRED Division facilities showing survivals in those stocks from which fish were released in 1981.

Facility	Brood year, Brood stock	Number produced/(Actual percent survivals from previous stage to this stage)				
		Green eggs	Eyed eggs	Emergent	Fry	Fingerlings
			(90%)	(95%)	(95%)	(95%)
(Percent survival goals from previous stage to this stage)						
Beaver Falls	1980 Beaver Falls/ Disappearance Cr.	14,791,435	12,512,306 (85%)	11,626,095 <sup>a/</sup> (93%)	4,793,165 <sup>b/</sup> (97%)	
Klawock	1980 Klawock River	5,702,277	4,713,538 (83%)	3,435,670 (73%)	3,364,456 <sup>b/</sup> (98%)	
Crystal Lake	1980 Crystal Creek	39,041	25,488 <sup>c/</sup> (65%)	22,823 (90%)	12,802 <sup>b/</sup> (56%) <sup>d/</sup>	
Snettisham	1980 Neka River	2,508,100	2,356,525 <sup>e/</sup> (94%)	2,125,443 (90%)	2,043,258 <sup>b/</sup> (94%)	
	1980 Snettisham	108,700	97,772 <sup>e/</sup> (90%)	51,914 <sup>f/</sup> (53%)		
Hidden Falls	1980 Kadashan Bay	9,797,056	9,275,350 (95%)	9,112,525 (98%)	8,896,429 <sup>b/</sup> (98%)	
	1980 Seal Bay	132,140	120,758 (91%)	119,692 (98%)	117,509 <sup>b/</sup> (99%)	

<sup>a/</sup> Released 6,661,111.

<sup>b/</sup> Released.

<sup>c/</sup> Poor survival from green to eyed eggs due to design deficiencies in isolation incubation facility.

<sup>d/</sup> Poor survival due to white spot (coagulated yolk) disease.

<sup>e/</sup> Number of alevins seeded into incubators.

<sup>f/</sup> Cause of mortality is being investigated.



Table 12. Summary of pink salmon production from Central Region FRED Division facilities showing survivals in those stocks from which fish were released during 1981.

Facility	Brood year, Brood stock	Number produced/(Actual percent survivals from previous stage to this stage)				
		Green eggs	Eyed eggs	Emergent	Fry	Fingerlings
			(90%)	(95%)	(95%)	(90%)
(Percent survival goals from previous stage to this stage)						
Tutka Bay	1980 Tutka Creek and Tutka Lagoon	15,855,730	11,502,932 (73%)	10,423,954 <sup>a/</sup> (91%)	8,487,392 <sup>b/</sup> (81%)	
Russell Creek	1980 Russell Creek	4,514,000	4,145,000 (92%)	3,937,750 (95%)	3,740,863 <sup>b/</sup> (95%)	
Kitoi Bay	1980 Big Kitoi	32,420,914	28,499,454 (88%)	26,327,764 (92%)	26,245,143 <sup>b/</sup> (99%)	
Cannery Creek	1980 Cannery Creek	17,299,478	14,548,789 (84%)	14,388,752 <sup>b/</sup> (99%)		
	1980 Port San Juan		6,950,000 <sup>c/</sup>	6,950,000 <sup>b/</sup> (100%)		

<sup>a/</sup> 1,360,849 released into Tutka Lagoon, and 509,609 released into Paint River.

<sup>b/</sup> Released.

<sup>c/</sup> Received as eyed eggs from Port San Juan private hatchery.

Table 13. Summary of pink salmon production from Southeast Region FRED Division facilities showing survivals in those stocks from which fish were released during 1981.

		Number produced/(Actual percent survivals from pervious stage to this stage)				
Facility	Brood year, Brood stock	Green eggs	Eyed eggs	Emergent	Fry	Fingerlings
			(90%)	(95%)	(95%)	(95%)
		(Percent survival goals from previous stage to this stage)				
Klawock	1980 Klawock Creek	1,125,593	1,068,448 (95%)	979,150 <sup>a/</sup> (92%)	504,274 <sup>b/</sup> (98%)	

<sup>a/</sup> Released 465,800.

<sup>b/</sup> Released.

Table 14. Summary of rainbow trout production from Central Region FRED Division facilities, 1981.

Facility	Brood year, Brood stock	Number produced/(Actual percent survivals from previous stage to this stage)					
		Green eggs	Eyed eggs (90%)	Emergent (95%)	Fry (95%)	Fingerlings (90%)	>10g/fish (Percent survival goals from previous stage to this stage)
Ship Creek Complex	1980 Swanson (wild)	79,600	60,900 (77%)	60,900 <sup>a/</sup> (100%)	54,800 (90%)	33,541 <sup>b/</sup> (62%)	31,775 <sup>c/</sup> (95%)
	1980 Swanson (dom)	1,068,000	679,000 (64%)	577,100 (85%)	519,300 (90%)	399,300 <sup>d/</sup> (77%)	102,600 <sup>e/</sup> (80%)
	1981 Talarik	44,200	6,000 (14%)	5,600 (93%)	5,300 (95%)	5,000 <sup>f/</sup> (94%)	
	1981 Swanson (dom)	2,555,600	966,500 (38%)	618,700 (64%)	507,300 (82%)	349,700 <sup>g/</sup> (69%)	
Kitoi	1981 Big Kitoi	1,962	1,623 (83%)	1,586 (98%)			

<sup>a/</sup> Estimate revised at ponding.

<sup>b/</sup> 2,830 stocked, 225 released to Pathology.

<sup>c/</sup> 19,000 kept as brood stock. 12,775 others released.

<sup>d/</sup> Approximately 271,300 released.

<sup>e/</sup> 52,000 catchables released, 50,600 subcatchables released.

<sup>f/</sup> Released.

<sup>g/</sup> 138,000 released; 211,700 on hand.

Table 15. Summary of steelhead trout production from Southeast Region FRED Division facilities showing survivals in those stocks from which fish were released during 1981.

Facility	Brood year, Brood stock	Number produced/(Actual percent survivals from previous stage to this stage)					
		Green eggs	Eyed eggs	Emergent	Fry	Fingerlings	Smolts
			(90%)	(95%)	(95%)	(95%)	(80%)
(Percent survival goals from previous stage to this stage)							
Deer Mt.	1978 Ketchikan Creek	12,850	11,850 (92%)	11,559 (98%)			5,564 <sup>a/</sup> (48%) <sup>b/</sup>
	1979 Ketchikan Creek	6,111	6,111 (100%)	5,165 (85%)			1,146 <sup>c/</sup> (22%) <sup>d/</sup>
Klawock	1980 Klawock Creek	14,361	13,008 (91%)	12,812 (98%)			9,395 <sup>e/</sup> (73%)

<sup>a/</sup> Released 2,748 in 1980 and 2,816 in 1981.

<sup>b/</sup> Low survival due to vandalism and tank design problems.

<sup>c/</sup> Released into Ketchikan Creek.

<sup>d/</sup> Poor survival caused by destruction of lot by vandals.

<sup>e/</sup> 6,422 released in 1981. An additional 2,973 held over for release in 1982.

Table 16. Summary of grayling production from Central Region FRED Division facilities showing survivals in those stocks from which fish were released during 1981.

Facility	Brood year, Brood stock	Number produced/(Actual percent survivals from previous stage to this stage)			
		Green eggs	Emergent	Fry	Fingerlings
Clear AFS	1981 Jay Lake	238,080	45,224 <sup>a</sup> / (19%)		
	1981 Junction Lake	660,190	395,374 <sup>b</sup> / (60%)		

<sup>a</sup>/ Released.

<sup>b</sup>/ A total of 377,098 unfed fry were planted in various parts of the state. 18,276 were kept for rearing but died.

Table 17. Summary of sheefish production from Central Region FRED Division facilities showing survivals in those stocks from which fish were released during 1981.

Facility	Brood year, Brood stock	Green eggs	Emergent	Number produced/(Actual percent survivals from previous stage to this stage)			
				Weight			
				3,232/lb.	518/lb.	263/lb.	On hand
Clear AFS	1980 Koyukuk River	338,000	177,000 <sup>a/</sup> (52%)	21,750 <sup>b/</sup> (24.1%)	5,213 (68%)	4,078 <sup>c/</sup> (78%)	497 <sup>d/</sup>

<sup>a/</sup> 86,639 released.

<sup>b/</sup> 14,061 released.

<sup>c/</sup> 3,581 released.

<sup>d/</sup> Held for rearing experiment.

Table 18. Estimates of the number of eggs taken for incubation by FRED during 1981 by facility, brood stock, and species, including the number of fish killed during spawning and the number allowed to escape upstream.

Facility	Brood stock	Species	Eggs taken	Fish killed during spawning	Escapement <u>a/</u>
SOUTHEAST REGION					
Beaver Falls	Beaver Falls return	chum	5,554,398	5,001	0
	Disappearance Creek	chum	5,385,702	3,539	30,000
Crystal Lake	Crystal Creek	king	1,414,279	653	332
	Crystal Creek	chum	24,729	16	152
	Crystal Creek	coho	452,000	248	3,552
	Crystal Creek	steelhead	45,664	15	11
Deer Mountain	Cripple Creek	king	106,590	38	324
	Ketchikan Creek	coho	131,009	503	600
	Ketchikan Creek	steelhead	10,533	0	100
	Unuk River	king	134,111 <u>b/</u>		
Hidden Falls	Kadashan	chum	9,044,700	5,269	16,775
	Seal Bay	chum	313,000	156	2,000
	Hidden Falls return	chum	2,204,200	3,432	0
	Andrews Creek	king	175,995	66	559
Klawock	Klawock River	pink	4,380,344	4,914	230,091
	Klawock River	coho	95,576	62	1,039
	Klawock River	steelhead	45,160	0	150
	Klawock River	chum	2,591,602	1,592	410
	Big Salt	chum	493,794	358	1,000
	Real Marina	chum	159,414	391	1,200

-Continued-

Table 18. Continued.

Facility	Brood stock	Species	Eggs taken	Fish killed during spawning	Escapement <u>a/</u>
Snettisham	Neka River	chum	10,024,550	6,204	37,752
	Limestone Creek	chum	1,692,500	1,213	2,900
	Snettisham return	chum	1,114,350	1,059	0
	Situk River	king	18,430	19	700
	King Salmon River	king	20,000	10	140
	Andrews Creek	king	159,000	52	559
	Snettisham return	coho	602,400	346	0
	Speel Lake	coho	430,700	186	2,061
	Crescent Lake	Dolly Varden	71,000		
SOUTHEASTERN TOTAL:			46,895,730		
CENTRAL REGION					
Big Lake	Meadow Creek	sockeye	5,139,931	3,031	1,200
	Nancy Lake	sockeye	1,692,017	1,036	10,964
	Fish Creek	sockeye	522,073	362	45,886
	Fish Creek	coho	903,286	364	1,410
	Meadow Creek	coho	342,823	128	220
	Little Susitna River	coho	3,100	2	6,000
Cannery Creek	Siwash Bay	chum	1,125,300	963	5,000
	Cannery Creek return	pink	14,594,935	18,669	4,000
	Cannery Creek	chum	40,700	26	0

-Continued-



Table 18. Continued.

Facility	Brood stock	Species	Eggs taken	Fish killed during spawning	Escapement <u>a/</u>
Clear	Delta River	chum	549,120	285	6,300 <u>c/</u>
	Koyokuk	sheefish	806,760	22	...
	Salcha River	king	120,340	30	...
	Yukon River	sheefish	86,330	2	...
	Clear Creek	coho	164,790	58	717 <u>d/</u>
	Junction Lake	grayling	66,190	0	...
	Jay Lake	grayling	238,080	0	...
Crooked Creek	Bear Creek	sockeye	10,171,200	4,581	66,419
	Glacier Flat	sockeye	10,189,200	4,927	10,046 <u>e/</u>
	Crooked Creek	king	172,783	45	2,980
	Anchor River	steelhead	20,000	10	...
East Creek	Francis Creek	sockeye	6,165,272	3,097	26,000
	East Creek	sockeye	523,980	556	0
Gulkana	Gulkana River	sockeye	9,166,596	5,900	13,500
Karluk	Upper Thumb River	sockeye	4,200,000	3,129	6,000
Kitoi Bay	Kitoi Creek	pink	70,900,000	93,188	35,000
	Sturgeon River	chum	465,300	260	80,000
	Big Kitoi	rainbow	1,962	4	...
	Chignik	king	100,000	33	1,600
	Pisagshak	king	33,000	10	40
Russell Creek	Russell Creek	chum	14,200,000	7,160	16,500

-Continued-

Table 18. Continued.

Facility	Brood stock	Species	Eggs taken	Fish killed during spawning	Escapement <u>a/</u>
Ship Creek	Swanson (domestic)	rainbow	2,555,600	5,730	420 <u>f/</u>
	Bear Creek	coho	2,003,800	608	3,772
Tutka Bay	Tutka Lagoon	pink	19,174,400	20,458	0
	Tutka Creek	pink	2,094,400	1,989	28,000
	Tutka Lagoon & Creek	chum	21,002	29	300
CENTRAL TOTAL:			176,361,470		
EGG TOTALS BY SPECIES:					
		King:	2,454,528		
		Coho:	5,129,484		
		Sockeye:	47,581,269		
		Chum:	55,004,361		
		Pink:	111,144,079		
		Rainbow:	2,557,562		
		Steelhead:	121,357		
		Sheefish:	893,090		
		Grayling:	304,270		
		Dolly Varden:	71,000		
GRAND TOTAL:			225,261,000		

a/ Does not include fish used in egg take.

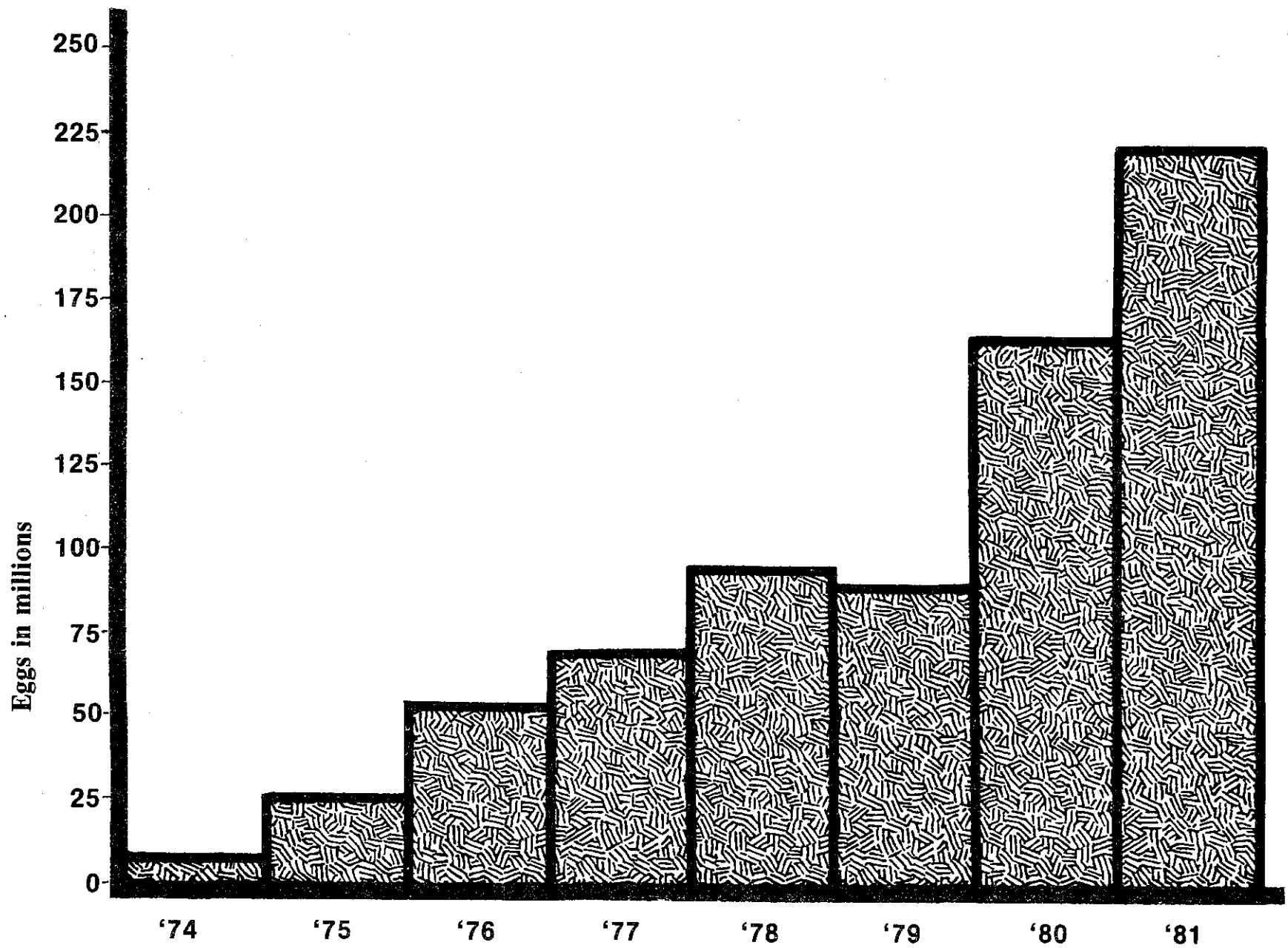
b/ Eyed eggs from Little Port Walter.

c/ Aerial survey done 10/9/81. Total escapement is higher.

d/ Weir count as of 10/23/81.

e/ Weir dismantled 8/21/81. Total escapement is higher.

f/ Brood stock planted.



**Figure 3.** Numbers of fish eggs taken for incubation at FRED hatcheries from 1974 through 1981.

Table 19. A projection of the numbers of adult salmon expected to result from eggs taken by FRED during 1981. a/

Fishing area	Numbers by Species				
	King	Coho	Sockeye	Chum	Pink
Southeastern	37,841	105,662		500,494	35,872
Prince Wm. Sound		31,000	41,250	17,991	118,510
Cook Inlet	2,000	19,275	217,208	171	691,023
Kodiak	616		18,050	3,778	863,828
Alaska Peninsula				115,304	
Bristol Bay			40,069		
Interior	2,229	10,172		8,473	
Totals:	42,686	166,109	316,577	646,211	1,709,233
Grand Total:	2,880,816				

a/ These adults will return over several years, beginning in 1983. Projections are based on standard ocean survival rates except where several years of actual return data were available.

Table 20. FRED Division egg take objectives for 1982.

Incubation site	Brood stock, Species	Number of eggs
CENTRAL REGION		
Big Lake	Meadow Creek, Nancy Lake,	15,000,000
	and Fish Creek, sockeye	
	Fish Creek, coho	5,000,000
Cannery Creek	Cannery Creek, pink and Siwash Creek, Eaglek, chum	53,000,000
Clear	Delta River, chum	500,000
	Clear Creek and Salcha River, king	220,000
	Clear Creek, coho	325,000
	Tolsona Lake, grayling	1,250,000
	Koyukuk, sheefish	1,500,000
Crooked Creek	Tustumena Lake, sockeye	20,000,000
East Creek	Francis Creek and Lake Nunavaugaluk, sockeye	15,000,000
Gulkana River	Gulkana River, sockeye	10,000,000
Karluk	Thumb River, sockeye	20,000,000
Kitoi Bay	Hatchery return, pink	70,000,000
	Chignik, king	300,000
	(Undetermined), chum,	500,000
	(Undetermined), rainbow trout	250,000
Kotzebue	Noatak River, chum	2,000,000
Main Bay	Cannery Creek, pink	15,000,000
	Wells River, chum	3,300,000

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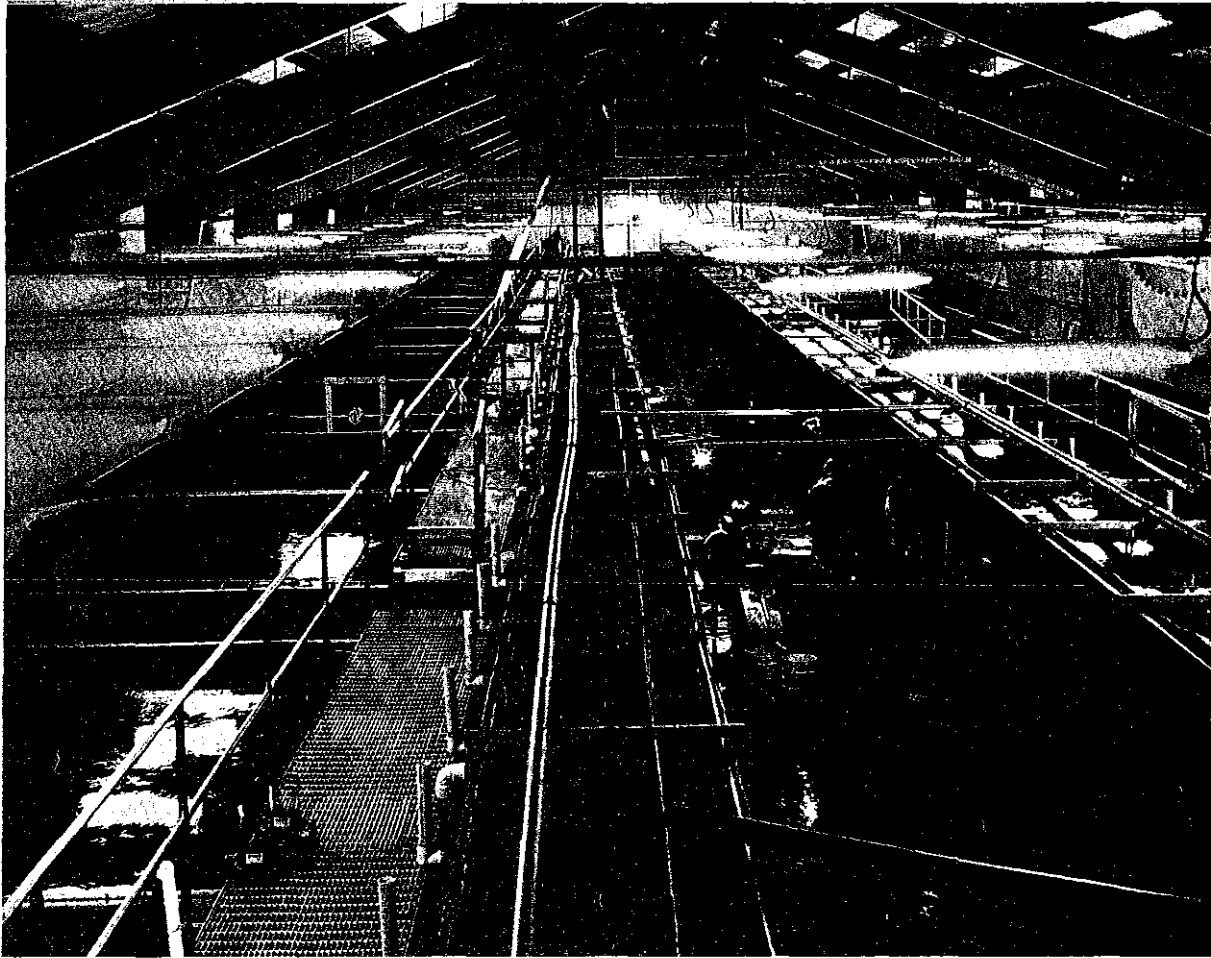
Table 20. Continued.

Incubation site	Brood stock, Species	Number of eggs
Russell Creek	Russell Creek, pink and chum	14,000,000
Ship Creek Complex	Crooked Creek, king	800,000
	Swanson River and Talarik River, rainbow trout	800,000
	Seward, coho	1,700,000
	Anchor River and Crooked Creek, steelhead	100,000
Trail Lake	Kenai River System, sockeye	7,000,000
	Kenai River System, coho	3,000,000
	Kenai River System, king	1,000,000
	Anchor River, steelhead	10,000
Tutka Bay Lagoon	Hatchery return, pink and chum	20,000,000
SOUTHEAST REGION		
Beaver Falls	Hatchery return, chum	3,000,000
	Disappearance Creek, chum	12,000,000
Crystal Lake	Hatchery return, king	580,000
	Andrews Creek, king	200,000
	Hatchery return, coho	840,000
	Crystal Creek, chum	300,000
	Hatchery return, steelhead	50,000
Deer Mountain	Hatchery return, king	30,000
	Hatchery return, coho	200,000
	Ketchikan Creek, steelhead	20,000
	Unuk River, king	170,000
Hidden Falls	Hatchery return, chum	18,500,000
	Kadashan and Seal Bay, chum	11,500,000

-Continued-

Table 20. Continued.

Incubation site	Brood stock, Species	Number of eggs
	Clear River, chum	300,000
	Little Port Walter, king	200,000
Klawock	Hatchery return, chum	800,000
	Hatchery return, coho	300,000
	Klawock River, steelhead	50,000
	Other sites, pink and chum	10,000,000
Snettisham	Neka River, chum	10,000,000
	King Salmon River, king	50,000
	Situk River, king	530,000
	Hatchery return, coho	1,300,000
	Hatchery return, king	70,000
	Hatchery return, chum	600,000
	Crescent River, Dolly Varden	50,000
TOTALS:		
	King:	4,150,000
	Coho:	14,465,000
	Sockeye:	87,000,000
	Pink and	
	Chum:	260,500,000
	Rainbow and	
	Steelhead:	1,280,000
	Dolly Varden:	50,000
	Sheefish:	1,500,000
	Grayling:	1,250,000
GRAND TOTAL:		363,395,000



Fish culturists work in the large hatchery at Klawock. The hatchery has a capacity of 78 million salmon eggs. (ADF&G photo by Russ Dixon)



## MEANS OF SALMONID ENHANCEMENT

### State Hatcheries

The FRED Division operates 17 hatcheries throughout the state. Three more hatcheries are under construction and scheduled to come on line during 1982. A list of all 20 hatcheries is presented in Table 21 along with their locations, primary production species, egg capacities, and status. Figure 4 illustrates the general locations of these hatcheries on a map of Alaska. The total operational capacity of FRED hatcheries as of the end of 1981 is approximately 550 million fish eggs. By the end of 1982, with the completion of hatcheries at Sikusuilaq Springs, Main Bay, and Trail Lakes, FRED's operational egg capacity will be 672.1 million.

Hatcheries are used as a production base for salmon rehabilitation and enhancement programs because they are roughly eight times more efficient in converting eggs to fish than the natural environment. Hatcheries increase survivals over the natural environment in four major ways:

- 1) Artificial spawning ensures the fertilization of nearly 100% of the ripe eggs.
- 2) A steady flow of water through specially designed incubators provides oxygen to all eggs and prevents suffocation.
- 3) Eggs and alevins in hatcheries are protected from freeze-ups and predation.
- 4) Feeding fish at a hatchery increases their size before they are released into the wild to fend for themselves.

The efficiency of hatchery production shortens the time required to rehabilitate depleted stocks, and provides the only way to meet the demands of anglers and maintain sport fisheries in the more heavily populated areas of Alaska.

### Fishways

By providing fish access to new or underutilized spawning areas, fishways are an effective tool of salmon enhancement. FRED, often in cooperation with other agencies, is involved in the construction and maintenance of 18 fishways throughout the state. A list of fishways, and numbers and species of salmon utilizing them, is presented in Table 22. Figure 5 illustrates the general location of these fishways on a map of Alaska. In reading Table 22, it should be remembered that the numbers are estimates of fish going up the fishway. No extrapolations are available on the numbers of their cohorts that were harvested.

One of the most successful fishways in the world is located on the Frazer River on Kodiak Island. The fishway is a steep pass system that allows salmon to pass a 33-foot waterfall and reach the spawning gravel of Frazer

Lake. An estimated 380,000 salmon, nearly all of them sockeye salmon, were counted through the fishway during 1981. This is a remarkable success when one realizes that Frazer Lake was inaccessible to anadromous fishes before the original fishway was built in 1962. Most of the fishways in Alaska are steeppasses, culvert-like tunnels of aluminum. Inside the steeppass is a series of baffles that turns the energy of the flowing water against itself, decreasing the velocity and allowing fish to ascend. The steeppass is lightweight and can be flown in sections to remote locations and assembled on site.

Other types of fishways provide a path around the barrier, or consist of pools within a cataract to provide resting areas for migrating fish. These types are effective, but usually involve more construction than a steeppass and have limited application in areas away from established road systems.

### Habitat Alteration

In 1981, Bear Lake near Seward became the second lake to undergo fertilization as part of the state's lake enrichment program ( see also Limnology). Bear Lake is a primary rearing area for coho salmon fry. Pre-fertilization studies showed that most of the current primary production (phytoplankton) within the lake was not being transferred up the food chain to fish. Nitrogen was added to the lake to alter nutrient ratios so that more beneficial algal species will multiply during 1982.

The fertilization of Hugh Smith Lake was continued during 1981 with the cooperation of the Southern Southeast Regional Aquaculture Association. Low rainfall in the Boca de Quadra area reduced the flushing of the lake, causing a buildup of phosphorus. The prescription for the lake was altered in 1981 to adjust for this. Results of the first six months of fertilization during 1980 indicated a definite transfer of nutrients up the food chain, stimulating the production of species upon which young coho salmon feed.

FRED's Limnology staff is acting as principal investigator in cooperation with the Valdez Fisheries Development Association and the Alaska Department of Environmental Conservation on a federal Environmental Protection Agency grant to study Robe Lake. The intent of the grant is to determine what can be done to alter the lake's water quality to make it a more productive habitat for rearing populations of sockeye and coho salmon.

Humpy Creek, a stream at Unalaska, continued to show the benefits of a logjam clearance project in 1978. An estimated 28,000 pink salmon were seen in that system in 1981.

The connection of landlocked ponds to the Chilkat River was apparently a success. Coho salmon juveniles utilized the newly accessible ponds for rearing. Twenty-nine additional ponds with similar potential were discovered.

### Predator Control

An estimated 30,000 to 40,000 Dolly Varden char were again impounded near the Russell Creek Hatchery at Cold Bay. The containment was used as a biological tool to prevent the char from preying on millions of hatchery and wild chum salmon fry as they migrate to salt water.

Table 21. Status of state hatcheries in Alaska, 1981.

Year on line	Facility	Location	Primary species	Egg capacity (millions)	Status
FY 62	Ship Creek <u>a/</u>	Anchorage	rainbow/coho/king	10.0	reconstruction
FY 72	Crystal Lake	Petersburg	king/coho	5.8	operational
FY 73	Gulkana River <u>b/</u>	Paxson	sockeye	10.0	operational
FY 76	Beaver Falls	Ketchikan	chum	20.0	operational
FY 77	Deer Mountain <u>c/</u>	Ketchikan	king/coho/steelhead	1.0	operational
FY 77	Big Lake	Wasilla	sockeye/coho	20.0	operational
FY 77	Crooked Creek	Kasilof	sockeye	20.0	operational
FY 77	Tutka Lagoon	Kachemak Bay	pink/chum	20.0	operational
FY 77	Kitoi Bay	Afognak Is.	pink/chum	50.0	operational
FY 79	East Creek	Dillingham	sockeye	15.0	operational
FY 80	Russell Creek	Cold Bay	chum/pink	52.0	operational/shakedown
FY 80	Hidden Falls	Baranof Is.	chum/coho	65.0	operational
FY 80	Klawock	Klawock	chum/coho	78.0	operational
FY 81	Cannery Creek	Prince Wm. Sound	chum/pink	80.0	operational/shakedown
FY 81	Clear AFS	Anderson	chum/king/grayling/sheefish	2.5	operational/shakedown
FY 81	Snettisham	Juneau area	chum/coho	75.8	operational/shakedown
FY 81	Karluk Lake <u>d/</u>	Kodiak Is.	sockeye	25.0	operational
FY 82	Main Bay	Prince Wm. Sound	chum/pink	80.0	construction/brood stock development

-Continued-

Table 21. Continued.

Year on line	Facility	Location	Primary species	Egg capacity (millions)	Status
FY 82	Trail Lakes	Moose Pass	sockeye/king/coho	40.0	construction
FY 82	Sikusuilag Springs	Kotzebue area	chum	<u>2.0</u>	construction
TOTAL:				672.1	

- a/ Also known as the Ship Creek Complex, comprising two facilities on the Ft. Richardson and Elmendorf military bases. The Elmendorf facility came on line in FY 78.
- b/ Stream-side incubation boxes, not a hatchery building. A cooperative project with the Division of Commercial Fisheries.
- c/ Owned by the City of Ketchikan, operated by FRED.
- d/ Stream-side incubation boxes, not a hatchery building.

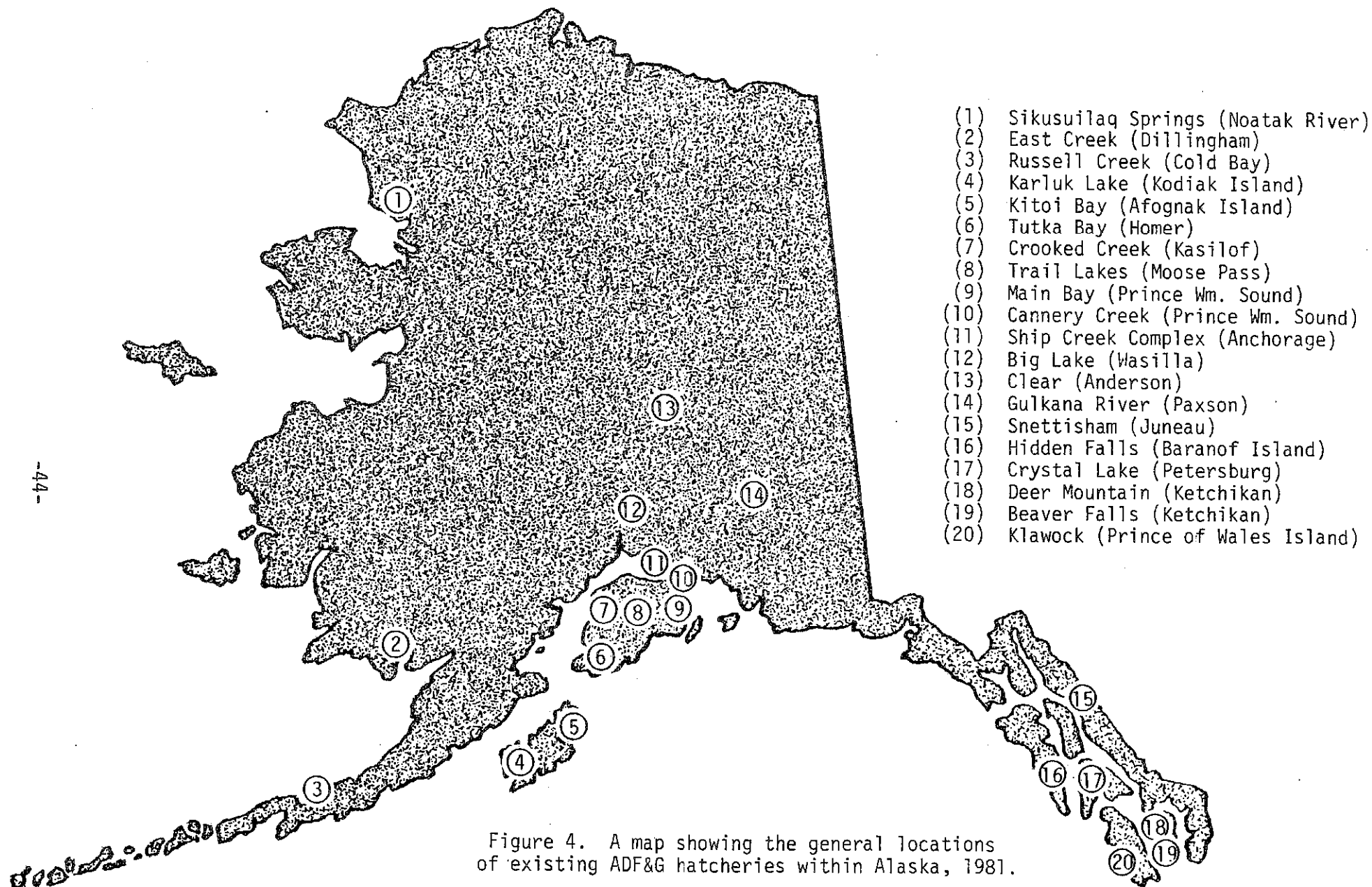
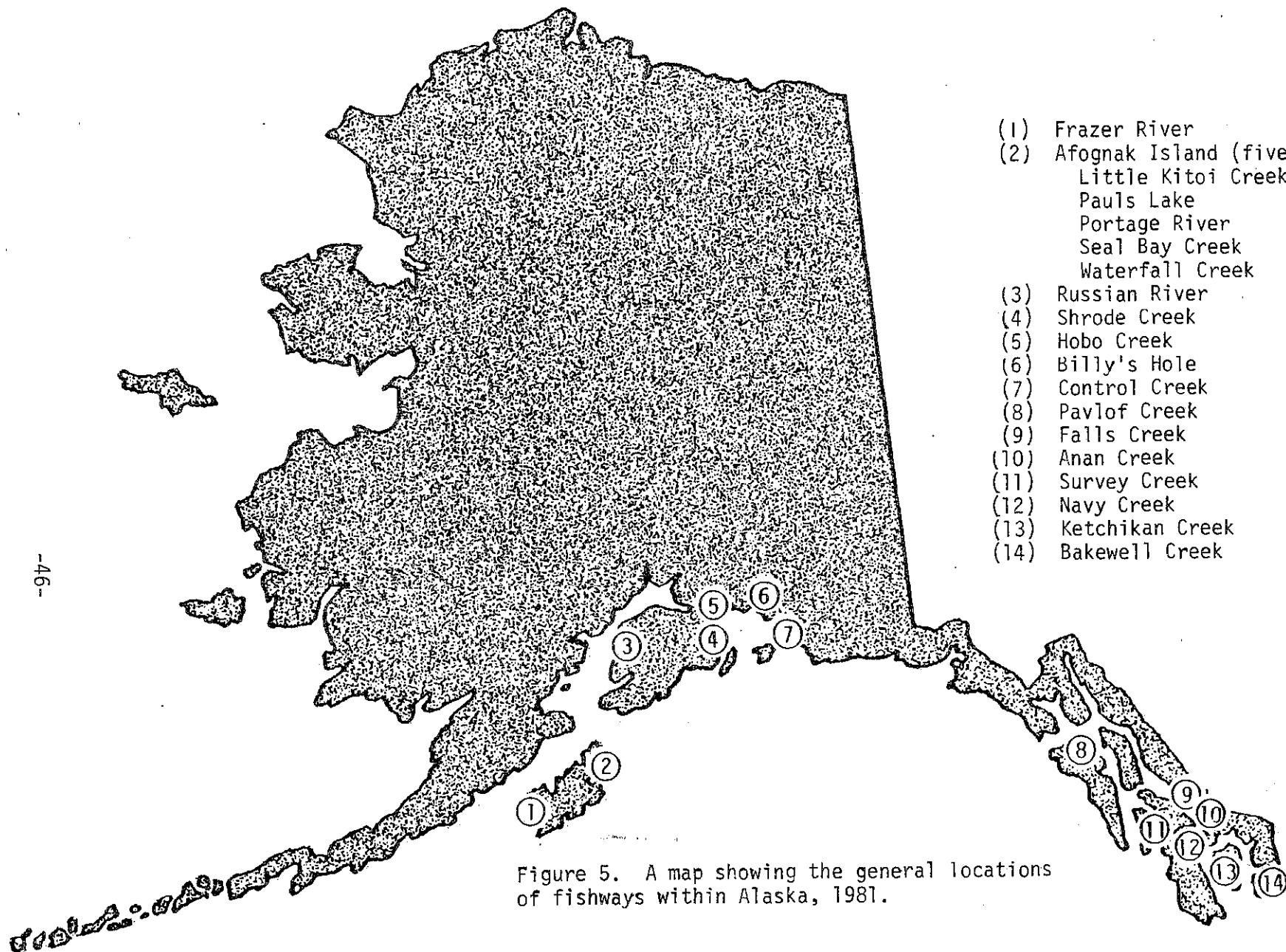


Table 22. Fishways in Alaska in 1981 and the numbers and species using them.

Area	Location	Species	Approximate number of fish utilizing fishway
Southeastern	Anan Creek	pink,chum,coho,sockeye	79,100
	Bakewell Creek	pink,coho,sockeye,steelhead	1,500
	Falls Creek	pink,coho	unassessed
	Ketchikan Creek	pink,chum,coho,sockeye,king	10,000
	Navy Creek	pink,chum,coho	18,700
	Pavlof Creek	pink,chum,coho,sockeye	1,500
	Survey Creek		not operating
Kodiak	Frazer Lake	chum,sockeye,king	380,000
	Little Kitoi Creek	pink,coho,sockeye	1,000
	Pauls/Laura Lake	coho,sockeye	22,000
	Portage River	pink,coho,sockeye	50,000
	Seal Bay Creek	pink,coho	14,000
	Waterfall Creek	pink,coho	61,000
Prince William Sound	Billy's Hole	sockeye	4,000
	Control Creek	pink,chum	20,000 <sup>a/</sup>
	Hobo Creek	pink	7,000
	Shrode Creek	pink	40,000
Cook Inlet	Russian River	coho,sockeye,king	100,000
Total			809,800

<sup>a/</sup> Fishway used only by odd year pinks.







FRED fish culturist Lynn Mayer clips fins from juvenile coho salmon at the Big Lake Hatchery. Finclips identify the fish as hatchery products and aid biologists in evaluating adult returns. (ADF&G photo by Mark Kissel)

## TECHNOLOGY AND DEVELOPMENT

The disciplines of fish culture, biology, genetics, limnology, pathology, and engineering are represented in the Technology and Development (T&D) branch of FRED. Collectively, this branch is responsible for quality control, research, development, and the continued improvement of the technology used in the FRED program. The T&D branch meshes closely with the Operations branch.

### Fish Culture

FRED's fish culturists operate 17 hatcheries throughout the state. During 1981, these hatcheries produced more than 131 million young fish. In addition to their production responsibilities, fish culturists are involved in developing and testing techniques for better and more efficient aquaculture.

Fish culturists also played a leading role in developing economic models for state hatcheries. With more than five years of hatchery production experience and adult return information, FRED initiated detailed economic analyses and projections for several hatcheries. These analyses utilize four models. The results, calculated by computer, include total return on investment, year of pay back, and the ratio of benefits to costs.

During 1981, fish culturists improved the efficiency of an electronic fry counter and also discovered that the machine accurately counts live eyed salmon eggs as well. These achievements mean more accurate counts of eggs and fry and increased labor efficiency.

At most FRED hatcheries, the increase in water temperatures each spring stimulate fry to emerge voluntarily from the incubator substrate. At other hatcheries, where water temperature remains nearly constant year round, fry must be removed from the incubators manually. This is not only labor intensive, but it often places unhealthy stresses upon the young fish. Personnel at the Hidden Falls Hatchery, however, developed a device that separates chum salmon fry from saddle substrate. The device consists of a shallow box with turbulent water into which the saddle-fry mixture is placed. This mixture then tumbles onto a dewatering grid through which the fry fall into a trough. The saddles continue over the grid into a receptacle. This device was tested with good results during 1981. In addition to separating the fry from the substrate, the device cleans the substrate. Tests of this device will continue.

The ability of chum salmon fry to adapt to salt water varies with the stock and degree of physical development. Fish culturists must know when the stocks they deal with can tolerate salt water, so they can plan appropriately for saltwater or freshwater rearing. In many cases, saltwater rearing is easier and less costly than freshwater rearing. Saltwater tolerance tests conducted during 1981 determined that emergent

fry at the Beaver Falls Hatchery can be held in salt water as soon as they are ready to feed. Test groups of fry at the Hidden Falls Hatchery, however, did not adapt to salt water as quickly. Saltwater tolerance tests have become a standard operating procedure at hatcheries where saltwater rearing of chum fry is desirable.

The ability of hatchery-produced king and coho salmon juveniles to adapt to salt water is tested prior to release. The fish are exposed to salt water for 24 hours. If they maintain their blood sodium level close to that of freshwater juveniles, then they are true smolts that can survive in salt water. This test will become a standard procedure at all hatcheries that produce salmon, steelhead, and char smolts.

Sheefish were successfully reared on an artificial diet at the Clear AFS Hatchery. This is the first such success with sheefish anywhere in the world, as far as is known. Some of the fish exceeded 40 g in weight and 160 mm in length less than one year after hatching.

Problems with the rainbow trout brood stock at the Ship Creek Hatchery Complex were addressed with the design of a better rearing environment at Fort Richardson. Reconstruction of that facility is scheduled to be completed in 1982. A team of scientists is currently developing a program for establishing a viable brood stock at both Ship Creek and Clear AFS Hatcheries.

Tutka Lagoon Hatchery achieved its greatest survival of pink salmon brood stock ever in 1981, overcoming a recurrent problem of high mortality among brood stock there. Survival of brood stock held in saltwater holding pens exceeded 95%. This success was achieved by maintaining a minimal holding period and spawning females soon after they became ripe.

### Biology

Biologists are involved in every rehabilitation and enhancement project from the initial field surveys through the project proposals to the post-project evaluation. Information gathered and interpreted by FRED's biologists becomes the basis for refining the division's enhancement techniques and for determining the direction of salmonid enhancement in Alaska.

With fewer dollars available for research projects in 1981, a significant part of FRED biologist's time was spent helping to make hatcheries more efficient. Activities included preparing experimental designs and testing various hatchery techniques. Biologists studied incubator substrates and densities, release timing, adult salmon behavior and methods of capture, diets, fish marking, fry condition, and hatchery-water intake modifications.

Some of the most significant work undertaken during 1981 was a comparative study of fish diets. A newly developed food, Alaska Dry Pellet performed at least as well as a standard moist diet that is widely used throughout the Pacific Northwest. The results are encouraging, because a dry diet would eliminate the need for frozen storage of fish feed, require less storage area, and improve logistics.

For the first time, a coordinated plan was developed within ADF&G to learn about hatchery and wild salmonid survivals, migration routes, run timing, and exploitation rates. Unfortunately, funding was not appropriated to do the research. The base is now established, however, and work can be started as soon as funds are made available.

Approximately 7,500 coded wire tags were dissected and read in Sitka and Ketchikan. Biologists estimated that approximately 20% of the commercial catch of these two species were sampled for coded wire tags.

A tag processing lab is being created in Juneau. Tags recovered from all parts of the state will be read and processed there. The lab should be operational in April. After a tour of other states' tag processing labs a "Draft Procedures Manual for the Coordinated Mark/Tag and Recovery Program" was written.

Biologists were involved in preparing several other methods manuals and workshops. All of these were aimed at the standardization of sampling and analysis methods, so that various research projects could be compared on a common basis. Workshops included the Fry, Smolt, and Adult Enumeration Gear Workshop, and the Mark, Tag, and Recovery Workshop. The "Manual for Estuarine Environmental and Zooplankton Studies" was a product of one of the workshops. Another important standardizing document was the "Lake Stocking Guidelines," which is in final review at this time.

FRED participated in hydroacoustical surveys of sockeye salmon populations in Tustumena Lake. Tow netting was not enough by itself to measure fish distribution and abundance, but a combination of the two techniques may add to our understanding of the movement and habits of salmonids in fresh water.

Biologists measured physical characteristics of Hidden Falls Lake in an attempt to predict the depth at which the hatchery could get the needed 4°C water. By lengthening the pipeline intake to the appropriate depth, hatchery operations and efficiency would be greatly improved.

Biologists and other ADF&G personnel completed annual hatchery harvest management plans. These plans are necessary for efficient use of the resource, and for development and maintenance of hatchery brood stocks.

The connection of landlocked ponds to the Chilkat River in 1980 was apparently a success. Coho salmon juveniles utilized the newly accessible ponds for rearing. Twenty-nine additional ponds with similar potential were discovered.

FRED successfully produced an odd-year run of pink salmon to previously barren Hobo Creek in Prince William Sound. An artificially produced even-year run is expected back in 1982. FRED hopes the runs, initiated with hatchery fish, will become self-sustaining.

Biologists continued to survey and study many facets of our northern-most hatchery site at Sikusuilag Springs. Information was gathered on Noatak River chum salmon and habitat, the hatchery water supply, potential egg sources, and the potential for using recirculated water for incubation when water quantity is limited.

Studies aimed at measuring the efficacy of using half-length coded wire tags to mark salmon fingerlings too small for full-length tags were performed and a draft report was written.

### Genetics

FRED's geneticist has established guidelines to protect the genetic diversity of wild and hatchery salmonid stocks. Scientists have found that such diversity is necessary to protect the reproductive potential of any species.

The genetics laboratory continues to develop and update biochemical genetic profiles of salmonid stocks by examining enzymes that are formed using the genes as templates. Initial profiles provide base-line data on the amount of genetic variation within and between stocks. Continued monitoring of the stocks will detect any significant reductions in genetic variation, allowing FRED to take remedial action. These data are also used to study the genetic structure of stocks. During 1981, profiles were developed on 17 potential brood stocks (Table 23).

FRED's geneticist continued studies to determine the efficacy of tagging hatchery fish genetically. By selectively breeding hatchery fish for a low frequency genetic variant, FRED can increase its frequency, making it useful as a mark. The genetic mark can be used to evaluate a hatchery's contribution to a fishery, much as fin clips and coded wire tags are now used. Studies were initiated at Tutka Hatchery to determine if genetic marking of pink salmon could be accomplished efficiently at a production facility.

A total of 1,883 males (pink salmon) were screened at the Tutka Hatchery to detect those carrying either one or two doses of the variant form of an enzyme, alpha-glycerophosphate dehydrogenase (AGP). Of the 1,883 males screened, 297 were found to carry the variant. They were used to fertilize approximately 2 million eggs. This selection increased the frequency of the variant gene from 8.7% to 11% in the hatchery-produced fish. When these pinks return as adults in 1983, the success of the genetic tag will be evaluated.

A similar genetic marking experiment was conducted with sockeye salmon at the East Creek Hatchery. The variant form of the enzyme phosphoglucosmutase (PGM) was selected for use in East Creek fish only. This selection should be continued for another four years before any evaluation of the mark can be made.

## Limnology

Since the limnology laboratory was established in November 1978 at Soldotna, FRED's limnologists have taken a leading role in statewide lake enrichment projects, lake stocking projects involving salmon, and studies dealing with salmonid rearing capacities of different lake types. By analyzing a lake's chemistry, limnologists can determine whether, for example, adding chemical fertilizer to the water would increase survivals of young sockeye salmon, or whether it would make a good nursery lake for young coho salmon before they swim to the ocean.

The limnology section has cooperated with other state, federal, and private nonprofit organizations to plan enhancement and rehabilitation efforts with minimal duplication of effort. As a consequence, the limnology section established methods and procedures for data collection statewide to ensure that all chemical and biological samples are collected and preserved similarly, allowing comparison of data from lakes throughout the state. Cooperating agencies include the Cook Inlet Aquaculture Association (CIAA), the Prince William Sound Aquaculture Corporation (PWSAC), the Northern Southeast Regional Aquaculture Association (NSRAA), the Southern Southeast Regional Aquaculture Association (SSRAA), Valdez Fisheries Development Association, the U.S. Forest Service, the U.S. Fish and Wildlife Service, and Commercial Fisheries and Sport Fish Divisions of the ADF&G.

The lake fertilization program has grown. Second year pre-fertilization studies are being conducted on McDonald Lake (SSE), Falls Lake (NSE), and Crescent Lake (CI). Feasibility studies were conducted on Eshamy, McKinley, Kushtaka, Martin, and Tokun Lakes (PWS), Kegan, Bakewell and Salmon Lakes (SSE), Delight, Desire, Larson, Shell, and Byers Lakes (CI). In addition, limnological studies were conducted to assess the productive potential of a variety of lake systems, e.g., Nunavaugulak (BB); Karluk, Thumb and O'Malley (Kodiak); Upper Russian, Tustumena, Summit and Paxson (PWS). Two lakes were fertilized during 1981. Hugh Smith Lake was fertilized for the second year, and Bear Lake (CI) was fertilized for the first time. ( *see also* Habitat Alteration.)

Studies involving the coho salmon rearing potential of lakes continued in NSE in cooperation with NSRAA, and were initiated in three lakes (Butterfly, Delyndia, and Finger) in Northern Cook Inlet.

Another research effort is examining adult salmon decomposition rates as well as the nutrient content of adult sockeye, rearing fry, and smolts from a variety of Alaskan lakes. Still other lakes are being sampled at the request of FRED area biologists in conjunction with ongoing studies of the planting of hatchery fish.

The limnology laboratory is the backbone of this entire program. Scientists receive samples from throughout the state for a variety of projects: water samples are processed for algal nutrients, biological samples for primary and secondary production, and the stomachs of fry for an evaluation of fish feeding patterns. These data, and more importantly their interpretation, form a system-wide evaluation from which resource managers can draw to develop strategies for improving the state's fisheries.

An example of the laboratory's potential to deal directly with fish-related problems comes from another research project: the development of a method to determine the amount of the antibiotic oxytetracycline present in hatchery-reared fish. The results may provide a method for marking whole year classes of hatchery fish cheaply and without altering them physically. The method, as developed to date, is very promising. It is based on the fluorescence of the oxytetracycline molecule after extraction from the bone and cartilage of fish.

Scientists use their expertise not only to develop and carry out their own projects, but disseminate the knowledge generated from such projects to other researchers. Thus, the limnology section participated in scientific and informational presentations for the Cook Inlet Aquaculture Association's third annual meeting, the Alaska Fish Council, the State of Alaska House Resource Committee, the Bristol Bay Inter-Agency Meeting, and the 43rd meeting of the Pacific Fishery Biologist Association. In addition, members of the limnology section will be participating in a national workshop on the use of hydroacoustics to estimate rearing fish abundance in order to develop this technique for further use in Alaskan lakes.

Finally, limnology personnel used their expertise to review grant proposals for the National Oceanic and Atmospheric Administration (U.S. Department of Commerce), and have submitted technical manuscripts to be published in the leading journal Limnology and Oceanography and as chapters in a book on estuarine nutrient cycling edited by the staff at the Woods Hole Oceanographic Institute, Marine Biological Laboratory.

### Pathology

FRED's pathology section continued to provide consultation and diagnostic services to public and private hatcheries throughout the state, while continuing its research into fish diseases such as Infectious Hematopoietic Necrosis (IHN).

An experimental hardening of fertilized sockeye salmon eggs in 100 ppm iodophore solution to control IHN virus showed no significant difference in mortality. This experiment is being repeated on a production basis using 15 minute treatments. Results were inconclusive in another experiment in which adult fish were treated with warm water for four days to control the virus. An experiment was conducted with sockeye salmon fingerlings to determine the effects of holding them in 18°C water for a period of time. No abnormal behavior or mortality was seen. Fry survival data from the East Creek individual incubation project were compiled and statistically analyzed. No differences were found between fry from IHN virusinfected females and those from uninfected females in either survival or growth.

Analysis of pink salmon from Tamgas Creek Private Nonprofit (PNP) Hatchery at Metlakatla is underway to follow up on an apparent positive finding of IHN virus in pink salmon there. A confirmation of IHN virus in Alaskan pink salmon would increase the precautions necessary for the control of the disease within the state.

Large numbers of hatchery and brood stock samples were screened for pathogens during 1981. The adoption of extensive fish disease control regulations in January 1981, requiring permits for all transport, possession, and release of live fish, has increased the flow of samples through the fish pathology laboratory in Anchorage.

### Engineering

FRED's engineering staff worked on more than 50 projects during 1981 that required planning, design, or construction. The engineering staff, a part of FRED's Technology and Development branch, provides engineering services for the entire department. Projects ranged from routine feasibility studies to design construction inspections of large hatcheries. Among the major projects of 1981 were:

- 1) Main Bay Hatchery. Oversaw the construction of this \$7 million facility. At the end of 1981, the hatchery was 90% complete.
- 2) Fort Richardson Reconstruction. Oversaw the construction of this \$6 million hatchery. The hatchery was 55% complete at the end of 1981.
- 3) Trail Lakes Hatchery. Oversaw construction of this \$6 million facility, which was 80% complete at the end of 1981.
- 4) Sikusuilaq Springs Hatchery. Oversaw construction of this \$2.6 million hatchery. The facility was 98% complete at the close of 1981.
- 5) Beaver Falls Hatchery. Installed additional liner in the rock dike and continued plans for the eventual expansion of this facility.
- 6) Elmendorf (Ship Creek) Hatchery. Designed a new warehouse and office building, which was constructed during 1981.
- 7) Tsirku River. Constructed a 400-foot-long flood-restraining dike to keep the floodwaters of the Tsirku River out of Chilkat Lake.

Other major projects included installation of raceways and a fishway at Klawock Hatchery, overseeing the installation of a hydro-electric unit at Hidden Falls Hatchery, assisting in-house construction of a spawning shed and improvements on the weir at Crystal Lake Hatchery, and overseeing installation of cyclone filters at Crooked Creek Hatchery.

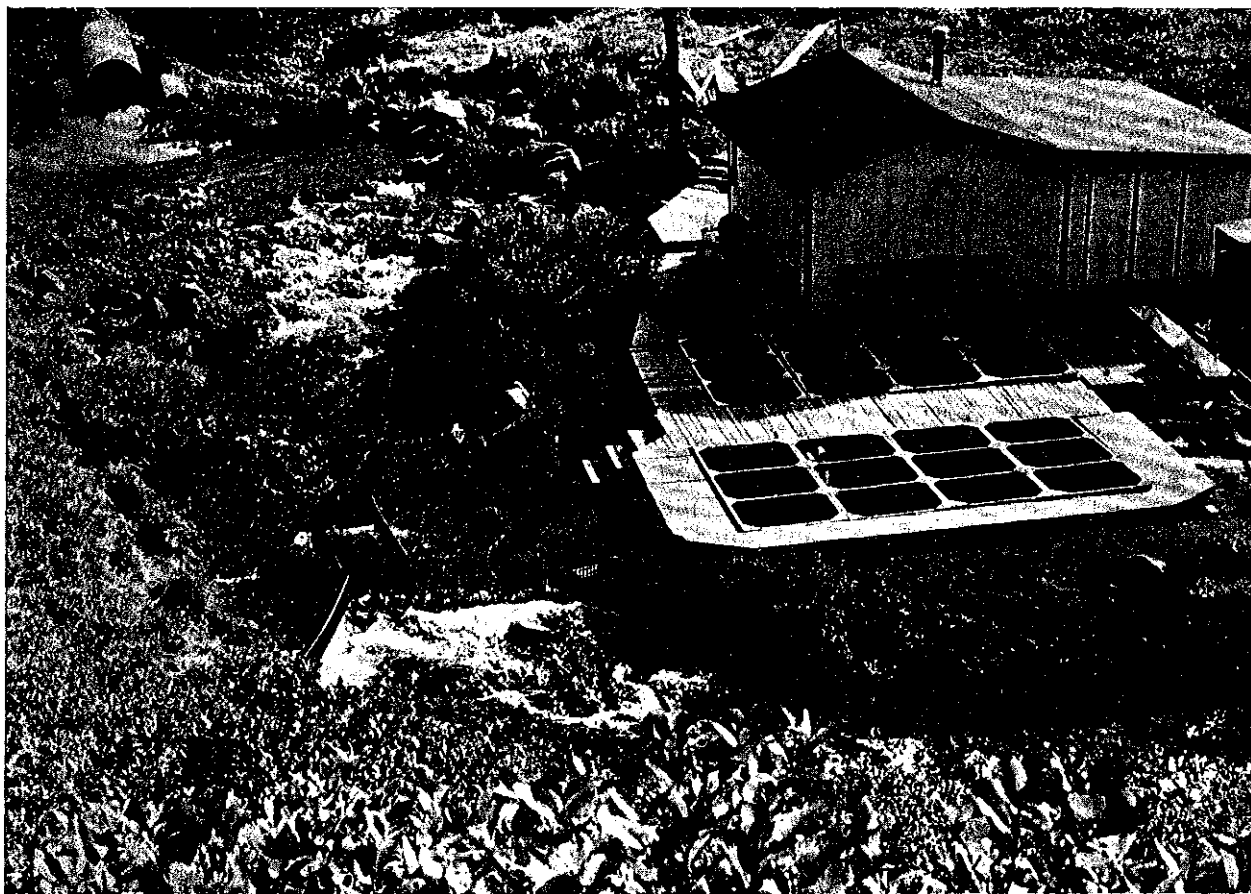


Table 23. Salmon stocks screened genetically during 1981.

Species	Stock	Location
Pink	Klawock River Cannery Creek Tutka Lagoon Kitoi Creek	Southeast Prince William Sound Kenai Kodiak/Afognak
Chum	Klawock River Beaver Falls Neka River Crooked Creek Eaglek River Sturgeon River	S. Southeast S. Southeast N. Southeast Prince William Sound Prince William Sound Kodiak
Sockeye	Glacier Flats East Creek Killian Creek	Kenai Bristol Bay Bristol Bay
Coho	Klawock River Speel Lake Bear Creek	S. Southeast N. Southeast Kenai
King	Crooked Creek	Kenai

Table 24. Lakes from which water quality data have been assembled by limnology staff in 1981, listed by area.

Area	Lakes		
Cook Inlet	Bear Chenik Cooper Crescent Delight Desire Grant	Kenai Leisure Lower Russian Upper Russian Packers Ptarmigan Quartz Creek	Tustumena Butterfly Byers Finger Delyndia Larson Shell
Prince William Sound	Eyak	Eshamy	Esther
Lower Copper River	Little Martin McKinley	Martin Tokun	Kushtak
Upper Copper River	Paxson Katherine	Summit	Mary Lou
Bristol Bay	Nunavaugaluk		
Kodiak	Karluk O'Malley River Cascade Creek Moraine Creek	Thumb Thumb River Halfway Creek Meadow Creek	O'Malley Alder Creek Grassy Point Creek Cottonwood Creek
Southern Southeast	Hugh Smith Luck Heckman	Kegan McDonald Nichols	Klawak Bakewell Salmon
Northern Southeast	Banner Crescent Gen Gen Hidden Falls Dick Politofski Sea Lion Cove Smiley	Benzeman Falls Twin Larry Houghton Redoubt Surprise Tranquill	Brentwood Farragut Glory Upper Didrickson Upper Nakvassin Deep Cove Sitkoh



The scientific/educational private hatchery on Humbolt Creek at Sand Point. In the left foreground is the weir, and to its right are rearing tanks. (ADF&G photo by Patty Judson)

## THE PRIVATE NONPROFIT HATCHERY PROGRAM

### Background

The Private Nonprofit Hatchery Program was created to provide user-group participation in rebuilding Alaska's depleted salmon fisheries. The 1974 Legislature passed a statute authorizing the Alaska Department of Fish and Game (ADF&G) to issue hatchery permits to qualified private nonprofit (PNP) corporations, and the 1976 Legislature authorized the creation of Regional Aquaculture Associations.

Since then, five Regional Aquaculture Associations have formed:

- 1) Cook Inlet Aquaculture Association (CIAA)
- 2) Lower Yukon/Kuskokwim Regional Aquaculture Association (LY/KRAA)
- 3) Northern Southeast Regional Aquaculture Association (NSRAA)
- 4) Prince William Sound Aquaculture Corporation (PWSAC)
- 5) Southern Southeast Regional Aquaculture Association (SSRAA)

Regional Associations comprise representatives of commercial fishermen and other user groups in the region, including sport fishermen, processors, subsistence fishermen, and members of local communities.

### Planning

The 1976 Legislature directed the Commissioner of ADF&G "to develop and amend as necessary a comprehensive salmon plan for each region, including provisions for both public and private nonprofit hatchery systems." Regional Planning Teams (RPT's), comprising members of the regional associations and departmental staff, have the responsibility to develop plans for their regions and review preliminary hatchery permit applications from private nonprofit corporations to determine their compatibility with the plan.

The 1979 Legislature provided grants of \$100,000 each to be distributed through the Commissioner of ADF&G to qualified Regional Associations for developing regional salmon plans in cooperation with the Department. The grants were issued to the four Regional Associations in existence at that time, CIAA, NSRAA, PWSAC, and SSRAA. Since then, LY/KRAA was formed and is taking part in planning. As a result of two of these grants, the Northern and Southern Southeast Regional Planning Teams have jointly produced a 20-year comprehensive salmon plan for Southeast Alaska. This plan has been approved by the Commissioner of ADF&G. Prince William Sound and Lower Yukon/Kuskokwim teams are in the process of developing plans and the Cook Inlet team has submitted a draft to the Commissioner for approval.

Additional planning funds were allocated by the 1981 Legislature and the regional associations were contracted to continue regional salmon planning. These funds are being used to conduct site-specific planning to meet the long-range goals of salmon production projected in the comprehensive plans.

### Loan Fund

In 1977, a Fisheries Enhancement Revolving Loan Fund was created within the Department of Commerce and Economic Development for the purpose of making loans to permit holders for the planning, construction, and operation of hatchery facilities. At that time, loans were limited to \$3 million for a hatchery constructed under a permit granted to a qualified Regional Association's nonprofit corporation, or to a local nonprofit corporation approved by a qualified Regional Association. A loan for any other nonprofit hatchery corporation project, a small "mom and pop" hatchery for example, was limited to \$300,000.

The 1980 Legislature raised the loan amounts for regional associations to \$6 million with a payment period of up to 30 years. Other PNP programs may now borrow up to \$1 million. Payments on the loan can be deferred from 6 to 10 years. The interest rate is 9.5%. To date about \$15 million has been borrowed by PNP corporations; the total could rise to \$21 million by the end of Fiscal Year 1982.

### Operational Hatcheries

Since the inception of the PNP program, 15 PNP salmon hatchery permits have been issued. Eleven of the permitted hatcheries are in operation, and six have already had returns of adult salmon. Figure 6 shows the general location of the 12 hatcheries that have been constructed. Nine preliminary or final hatchery applications are now pending. Lists of PNP hatcheries, proposed PNP hatcheries, and Scientific/Educational hatcheries are presented in Tables 25, 26, and 27. Their establishment and growth is contributing to the state's effort to rehabilitate depleted and depressed salmon fisheries.

### Adult Salmon Returns

PNP corporations reported that more than 2.5 million salmon that had been released from PNP hatcheries returned as adults in 1981 (Table 28). The Port San Juan facility operated by PWSAC was the leader again this year. The corporation estimated that over 1.3 million of their returning pink salmon were caught in the commercial fishery.

Returns since 1977 are presented by species in Tables 29, 30, 31, and 32. The first adults returning from PNP hatchery releases occurred in 1977. They were the result of egg takes by the only two hatcheries operating in 1975. The number of fish returning to PNP hatcheries has increased each year as new hatcheries become operational and egg take levels at existing hatcheries are increased. It is projected that by 1990 adult returns to PNP hatcheries could exceed 7.8 million fish.

### Hatchery Releases

During 1981, 101 million fish were released from PNP hatcheries (Table 33). That is an increase of 65 million fish over 1980 releases. PNP hatchery releases going back to 1976 are recorded in Tables 29, 30, 31, and 32.

Most PNP hatcheries are still developing brood stock and, therefore, have not reached their permitted egg capacities. Permitted capacities at PNP hatcheries total 362 million eggs, which could result in releases of up to 290 million juvenile fish.

### Egg Takes

Egg takes for PNP hatcheries totaled over 223 million in 1981 (Table 34). The 1980 egg take totaled approximately 125 million. By far, the largest egg take this year was at the Port San Juan hatchery. More eggs were taken there --152 million-- than at any other hatchery in the state, public or private. Total numbers of eggs taken since 1975 are recorded by species in Tables 29, 30, 31, and 32.

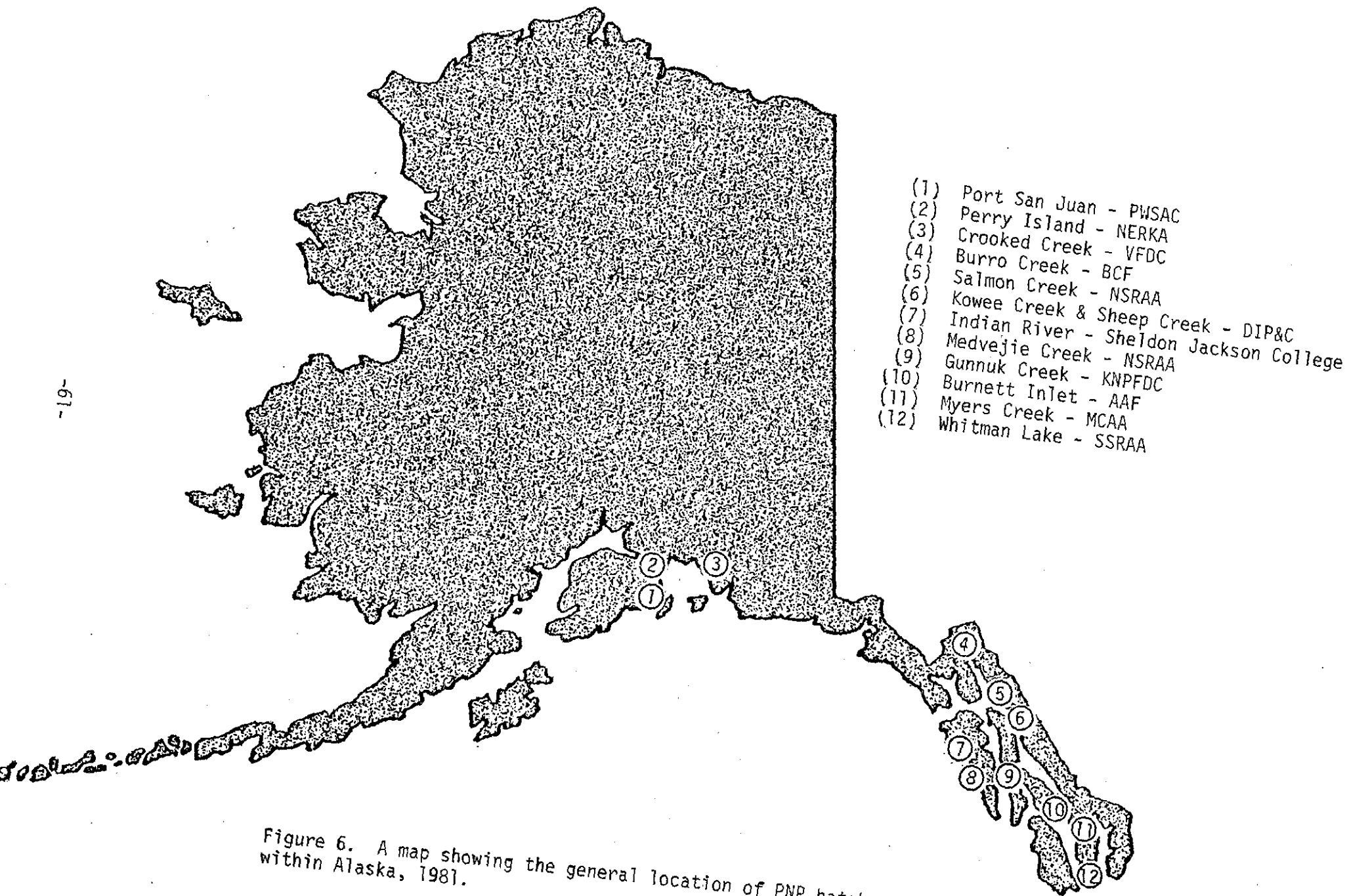


Figure 6. A map showing the general location of PNP hatcheries within Alaska, [1981].

Table 25. Permitted private nonprofit hatcheries, December 1981.

Corporation/Facility location	Status	Egg capacity
1. Southern Southeast Regional Aquaculture Association Whitman Lake, Ketchikan	PNP Permit #8, Operational Issued 3/9/78	26.8 million chum 2.3 million coho .4 million king
2. Alaska Aquaculture Foundation, Inc. Burnett Inlet, Etolin Island, Wrangell	PNP Permit #5, Operational Issued 4/28/76	4 million pink 5 million chum
3. Meyers Chuck Aquaculture Association Myers Creek, Myers Chuck	PNP Permit #10, Operational Issued 7/22/79	1 million pink
4. Kake Nonprofit Fishery Development Corporation Gunnuk Creek, Kake	PNP Permit #7, Not Operational Issued 4/1/77	1 million pink 2 million chum
5. Armstrong-Keta, Inc. Port Armstrong, Baranof Island	PNP Permit #13, Operational Issued 2/23/81	11 million chum
6. Tlingit & Haida Central Council Maksoutof River, Baranof Island	PNP Permit #4, Not Operational Issued 12/18/75	1 million pink 1 million chum
7. Northern Southeast Regional Aquaculture Association Medvejie Creek, Sitka	PNP Permit #16, Issued 8/17/81	20 million chum 3 million coho
8. Sheldon Jackson College Aquaculture program Indian River, Sitka	PNP Permit #3, Operational Issued 4/29/75	15 million pink & chum 200,000 coho

-Continued-



Table 25. Continued.

Corporation/Facility location	Status	Egg capacity
9. Douglas Island Pink & Chum, Inc. Kowee Creek, Juneau	PNP Permit #6, Operational Issued 7/30/76	6 million pink & chum
10. Douglas Island Pink & Chum, Inc. Sheep Creek, Juneau	PNP Permit #11, Operational Issued 9/18/79	10 million pink 1.25 million chum
11. Northern Southeast Regional Aquaculture Association Salmon Creek, Juneau	PNP Permit #14, Operational Issued 4/17/81	6 million pink & chum 0.8 million coho
12. Burro Creek Farms Burro Creek Skagway	PNP Permit #12, Operational Issued 5/23/80	10 million pink
13. Prince William Sound Aquaculture Corporation Port San Juan, Evans Island	PNP Permit #2, Operational Issued 7/1/76	150 million pink 13 million chum
14. NERKA, Inc. Perry Island, Prince William Sound	PNP Permit #1, Not Operational Issued 9/19/75	3 million pink & chum
15. Valdez Fisheries Development Corp. Crooked Creek, Valdez	PNP Permit #15 Issued 6/26/81	50 million pink 18 million chum 1 million coho

Table 26. Proposed private nonprofit hatcheries, December 1981.

Organization/Facility location	Status	Requested egg capacity
1. Ernest Sound Fisheries Enhancement Assn. Santa Anna Creek, Myers Chuck	PNP Preliminary Application Submitted 11/13/81	At start-up: 100,000 pink 1 million coho At capacity: 7 million pink 8 million chum 10 million coho 5 million king
2. Crittenden Creek Aquaculture, Inc. Crittenden Creek, Wrangell	PNP Preliminary Application Submitted 3/10/80	At start up: 4.5 million chum At capacity: 10 million chum
3. Twin Creek Salmon Ranch, Inc. Twin Creek, Petersburg	PNP Preliminary Application	At start-up: 500,000 pink
4. Angoon Aquaculture Association, Inc. Favorite Bay, Angoon	PNP Preliminary Application Submitted 9/15/80	At start-up: 1.15 million coho, pink, chum combined At capacity: 15.5 million coho, pink, chum combined
5. Dr. Norman Riddell Rust Creek, Chichagof Island	PNP Preliminary Application Submitted 2/9/81	At start-up: 6 million chum 3 million pink 500,000 coho 100,000 king  At capacity: 10 million chum 1 million coho 200,000 king

-Continued-

Table 26. Continued.

Organization/Facility location	Status	Requested egg capacity
6. Pelican Cold Storage Pelican Creek, Pelican	Preliminary Application Submitted 7/13/82 Approved 11/24/81	At start-up: 350,000 pink & chum At capacity: 1 million pink & chum
7. Prince William Sound Aquaculture Corporation Esther Lake, Prince William Sound	Preliminary Application Approved 7/13/77	At start-up: 10 million pink 2 million chum 2 million sockeye 2 million coho  At capacity: 40 million pink 10 million chum Capacity for sockeye and coho not know at this time
8. Cook Inlet Aquaculture Association Eklutna, Palmer	Final Application Submitted 1/26/81 Public Hearings Held- May 14, September 22, 23, and 24, 1981	20 million pink & chum
9. Village Islands Sea Ranching Uganik Bay, Village Islands, Kodiak Island	Final Application Submitted 2/10/81 Amended 6/22/81	10 million coho

Table 27. Permitted scientific/educational hatcheries, December 1981.

Organization/Facility location	Type of program	Permitted egg capacity
1. Kake City Schools Gunnuk Creek, Kake	Educational	40,000 pink 55,000 chum
2. Petersburg High School Petersburg	Educational	40,000 pink
3. Sheldon Jackson College Aquaculture Program Indian River, Sitka	Educational	Miscellaneous species (including invertebrates)
4. Skagway High School Pullen Creek, Skagway	Educational	200,000 pink
5. Valdez Fisheries Development Association Crooked Creek, Valdez Robe Lake, Valdez	Educational Research	400,000 chum 360,000 pink
6. Bartlett School Tyonek	Educational	4,800 pink
7. Cook Inlet Aquaculture Association Eklutna, Palmer	Research	Incubator evaluation 150,000 pink or chum 100,000 coho
8. Lower Yukon/Kuskokwim Regional Aquaculture Association Bethel (not operable) Mountain Village (not operable)	Educational	250,000 coho 250,000 pink 500,000 chum

-Continued-

Table 27. Continued.

Organization/Facility location	Type of facility	Permitted egg capacity
9. Sand Point JOM Parent Committee Humboldt Creek, Sand Point	Educational	200,000 pink and coho
10. Unalaska City School Unalaska	Educational	25,000 pink 58,500 coho

Table 28. Estimated 1981 adult returns for PNP hatcheries.

Facility	Pink	Chum	Coho
SSRAA - Whitman Lake	-	-	51,800
AAFI - Burnett Inlet	16,500	-	-
SJC - Indian River	195,000	38	250
DIPAC - Kowee Creek	14,000	100	-
NERKA - Perry Island	1,000	-	-
PWSAC-Port San Juan	2,264,845	20,380	-
TOTAL	2,491,345	20,518	52,050

Table 29. Summary of pink salmon production from PNP hatcheries.

Brood year	Eggs taken	Fry released <sup>a/</sup>	Total return	Special harvest <sup>b/</sup>	Value of harvest
1975	8,002,395	3,653,666	160,147	108,718	\$130,726
1976	16,251,456	12,093,184	160,397	114,188	\$141,799
1977	35,383,112	25,732,238	356,498	244,555	\$309,612
1978	34,851,807	28,204,674	1,504,878	346,168	\$436,171
1979	46,582,015	31,690,000	2,491,345	838,037	\$1,200,000 <sup>c/</sup>
1980	98,030,000	78,800,000			
1981	188,000,000				
Total	427,100,785	180,173,762	4,673,265	1,651,666	\$2,218,308

<sup>a/</sup> Fry released the year following egg takes.

<sup>b/</sup> Harvest by the hatchery.

<sup>c/</sup> Estimated

Table 30. Summary of chum salmon production from PNP hatcheries.

Brood year	Eggs taken	Fry released <sup>a/</sup>	Total return	Special harvest	Value of harvest
1975	77,000	66,075	543		
1976	347,275	264,068	3		
1977	1,614,574	1,064,000	1,588		
1978	1,684,930	924,400	20,518	6,115	\$24,460
1979	6,782,864	3,340,000			
1980	26,850,000	21,900,000			
1981	32,400,000				
Total	69,756,643	27,558,543	22,652	6,115	\$24,460

<sup>a/</sup> Fry released the year following egg takes.

Table 31. Summary of coho salmon production from PNP hatcheries.

Brood year	Eggs taken	Presmolts released <sup>a/</sup>	Smolts released <sup>b/</sup>	Total return	Special harvest	Value of harvest
1975	12,000	8,000	3,102	27		
1976	24,150	0	0	0		
1977	10,500	0	2,700	0		
1978	809,430	0	557,200	52,050	6,141	\$50,000 <sup>c/</sup>
1979	931,000	0	800,000			
1980	666,500	0				
1981	2,800,000					
Total	5,253,580	8,000	1,363,002	52,077	6,141	\$50,000

a/ Fish released the year following egg takes.

b/ Fish released second year following egg takes.

c/ Estimated.

Table 32. Summary of king salmon production from PNP hatcheries

Brood year	Eggs taken	Presmolts released	Smolts released	Total return	Special harvest	Value of harvest
1980	194,000					
1981	400,000					
Total	594,000	0	0	0	0	0



Table 33. 1981 releases from PNP hatcheries in millions.

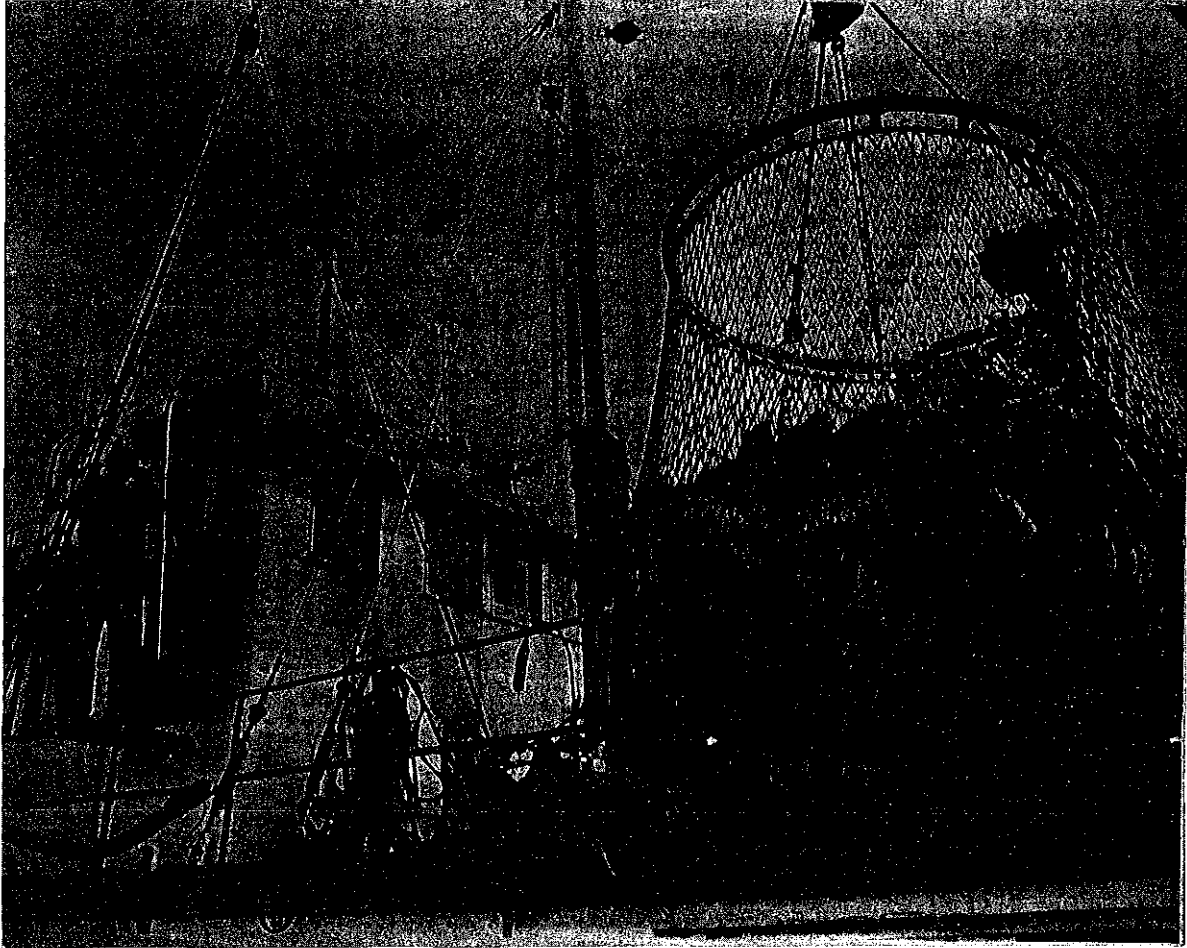
REGION/LOCATION	Pink	Chum	Coho
SOUTHERN SOUTHEAST			
SSRAA - Whitman L.	-	18.6	.8
AAFI - Burnett Is.	.1	.2	-
NORTHERN SOUTHEAST			
NSRAA - Salmon Cr.	.1	1.2	-
DIPC - Kowee Cr.	2.2	1.0	-
- Sheep Cr.	1.0	-	-
SJC - Indian R.	2.1	.1	.1
BCF - Burro Cr.	.7 <u>a/</u>	.1 <u>a/</u>	-
PRINCE WILLIAM SOUND			
PWSAC - Port San Juan	72.5	.7	-
NERKA - Perry Is.	.1	-	-
TOTAL	78.8	21.9	.9

a/ Released as eyed eggs and alevins.

Note: Pink and chum releases are from 1980 brood year, coho from 1979 brood year.

Table 34. 1981 egg takes for PNP hatcheries in millions.

REGION/LOCATION	Pink	Chum	Other
SOUTHERN SOUTHEAST			
SSRAA - Whitman L.	-	16.7	2.3 coho .4 king
AAFI - Burnett Is.	.3	1.2	-
MCAA - Meyers Cr.	.1	-	-
NORTHERN SOUTHEAST			
NSRAA - Salmon Cr.	2.3	3.8	.2 coho
- Medvejie Cr.	-	.3	.2 coho
DIPC - Kowee Cr.	3.9	.7	-
- Sheep Cr.	9.3	.1	-
SJC - Indian R.	17.5	.1	.1 coho
BCF - Burro Cr.	1.1	.4	-
PRINCE WILLIAM SOUND			
PWSAC - Port San Juan	143.5	8.6	-
VFDC - Crooked Cr.	10.0	.5	-
TOTAL	188.0	32.4	3.2



A haul of pink salmon is loaded aboard a tender in Tutka Bay. More than 90% of the pink salmon harvested in this area in 1981 were hatchery fish. (ADF&G photo by Mark Kissel)

## THE FRED PROGRAM

Salmon enhancement is not new to Alaska. Hatcheries were operated by salmon processing companies as early as 1900. However, a lack of understanding in those days regarding life histories and environmental needs of young salmon resulted in many failures. Today these problems have been overcome, but that does not mean that there is nothing new to learn about aquaculture.

Today's salmon enhancement program in Alaska is innovative for several reasons. For one, the involvement of private nonprofit aquaculture associations with ADF&G resulted in the development of broad-based salmon production plans within several regions of the state. New concepts in salmon incubation resulted in the development and operation of large (50 - 80 million eggs) production hatcheries. The addition of fry rearing programs and the timed release of fry into food-rich estuaries contribute to increased ocean survivals of hatchery fish. Extensive evaluation of hatchery stock performance is achieved through marking and coded wire tag studies that offer additional knowledge of all salmon stocks with which the tagged hatchery fish migrate and are caught. The rapid decoding of tags aids resource managers.

Alaska's salmon enhancement program is built upon a strong technological base. The Department operates three laboratories: genetics, pathology and limnology, which provide direction to the program through policies and decisions on the use and acceptability of specific stocks and individual stock transplants.

Natural stocks approved for hatchery brood-stock development are not indiscriminately removed from spawning areas. Instead, managers establish removal schedules based on known and expected stock abundance. Fishery managers also team with enhancement personnel to secure hatchery brood stock from returns while at the same time regulating terminal fisheries of hatchery stocks.

The growth of the ADF&G hatchery production program is depicted in terms of eggs taken (Figure 3) and in terms of adult returns (Figure 1). At present, the numbers of eggs incubated is at about 35% of FRED's already funded hatchery design capacity. Returns, which naturally lag behind egg takes, are at about 23% of the 9.3 million adults FRED hatcheries are expected to produce annually at funded capacity. FRED is now in a phase of rapid expansion, building brood stocks to levels that can support full production. This, however, cannot occur without continued financial support from the Legislature.

Table 35 lists present and projected public hatchery construction and operational costs. Fiscal Year 1982 hatchery budgets totaling \$5.8 million are actual allocations. Administration and evaluation costs have been added to arrive at a total operating budget for each facility. The added costs are rough estimates of time, effort, and material expended in support functions. These added costs are a standard 20% of each hatchery's budget.

Capital costs listed in Table 35 are the best figures available without reviewing individual fund transfer and spending documents. This review is now underway, and the results will be included in FRED's next annual report. The table, however, shows how much it will cost to bring these facilities to full production.

Table 35. Costs associated with State salmon hatcheries in Alaska in 1981 dollars.

Facility	Operating costs (thousands)						Capital cost (millions)		
	FY 82	Admin. and Eval.	Total	Full Prod.	Admin. and Eval.	Total	Present	Future	Total
Beaver Falls	268.0	53.6	321.6	350.0	70.0	420.0	0.79	3.686	4.476 Ea/
Deer Mountain	205.0	41.0	246.0	275.0	55.0	330.0	0.86	0.071	0.931 I
Klawock	382.0	76.4	458.4	600.0	120.0	720.0	5.32	5.175	10.495 C
Crystal Lake	422.0	84.4	506.4	550.0	110.0	660.0	3.50	1.219	4.719 I
Hidden Falls	445.0	89.0	534.0	600.0	120.0	720.0	5.32	5.175	10.495 C-I
Snettisham	371.0	74.2	445.2	550.0	110.0	660.0	7.10	3.098	10.198 C
Cannery Creek	349.0	69.8	418.8	500.0	100.0	600.0	4.14	0.925	5.065 C-E
Main Bay	136.0	27.2	163.2	600.0	120.0	720.0	8.34	2.00	10.34 C-E
Big Lake	205.0	41.0	246.0	300.0	60.0	360.0	1.00	0.60	1.60 E
Ship Creek	569.0	113.8	682.8	700.0	140.0	840.0	12.70	6.793	19.493 E
Trail Lakes	52.0	10.4	62.4	800.0	160.0	960.0	6.30	2.35	8.65 C
Crooked Creek	217.0	43.4	260.4	350.0	70.0	420.0	1.50	---	1.50 -
Tutka	311.0	62.2	373.2	400.0	80.0	480.0	1.37	1.45	2.82 C-E
Kitoi	321.0	64.2	385.2	400.0	80.0	480.0	1.11	4.20	5.31 E
Karluk	171.0	34.2	205.2	275.0	55.0	330.0	1.60	---	1.60 -
Russell Creek	533.0	106.6	639.6	600.0	120.0	720.0	5.40	7.25 R	12.65 R-C
East Creek	326.0	65.2	391.2	400.0	80.0	480.0	3.00	1.87	4.87 I
Clear	274.0	54.8	328.8	350.0	70.0	420.0	1.13	6.00	7.13 E
Sikusuilag Sp.	139.0	27.8	166.8	400.0	80.0	480.0	2.60	1.00	3.60 E
Gulkana	141.0	28.2	169.2	200.0	40.0	240.0	0.05	---	0.05 -
TOTALS	5837.0	1167.4	7004.4	9200.0	1840.0	11040.0	73.13	52.862	125.952
\$Thousands						\$Millions			

a/ E = Expansion  
 C = Completion  
 I = Improvement  
 R = Remedial

## ACKNOWLEDGEMENTS

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Special thanks to Dorie Hildre, who typed nearly all of this report.

APPENDIX A



9/27/81

## KH93091 FISH PLANTED IN 1980 BY KITOI LAY HATCHERY

PAGE 1

BR SR Y3	ORIGIN	STAGE	WATER STOCKED	TRIP DATE	NUMBER STOCKED	TOTAL WT IN KG...	MARKS	CWIND
KS 79	CHICONIX RIVER	FINGERLINGS	LAKE ROS: TEAD	6/09/80	93,259	137.39	NO	
H20	STOCKED TOTAL				93,259	137.39		
AGE TOTAL					93,259	137.39		
SPECIES TOTAL					93,259	137.39		
PS 79	BIG KITOI CREEK	SWIMUP FRY	KITOI BAY	4/30/80	19,095,491	4,811.50	NO	
PS 79	BIG KITOI CREEK	SWIMUP FRY	KITOI BAY	4/21/80	49,414	12.58	ADRV	
H20	STOCKED TOTAL				19,145,405	4,824.08		
AGE TOTAL					19,145,405	4,824.08		
PS 79	BIG KITOI CREEK	FINGERLINGS	KITOI BAY	5/18/80	32,021	20.20	ADLV	
PS 79	BIG KITOI CREEK	FINGERLINGS	KITOI BAY	5/18/80	3,281,821	2,070.17	NO	
H20	STOCKED TOTAL				3,313,542	2,090.37		
AGE TOTAL					3,313,542	2,090.37		
SPECIES TOTAL					22,458,947	6,914.45		
RS 79	LOWER THUMB RIVER	FEED FRY	UPPER THUMB RIVER	6/05/80	1,070,149	256.94	ADLV	
H20	STOCKED TOTAL				1,070,149	256.94		
AGE TOTAL					1,070,149	256.94		
SPECIES TOTAL					1,070,149	256.94		
HATCHERY TOTAL					23,622,355	7,308.78		

9/20/81

KR93091 FISH PLANTED IN 1980 BY FT RICHARDSON HATCH.

PAGE 2

SP YR	ORIGIN	STAGE	WATER STOCKED	TRIP DATE	NUMBER STOCKED	TOTAL WT IN KG.	MARKS	CHWING
GR 80	TOLSONA LAKE	FEED FRY	TEXAS #2	6/18/80	46,818	.51	NO	
H20	STOCKED TOTAL				46,818	.51		
GR 80	TOLSONA LAKE	FEED FRY	WEST POND	6/18/80	4,454	.05	NO	
H20	STOCKED TOTAL				4,454	.05		
AGE TOTAL					51,272	.56		
SPECIES TOTAL					51,272	.56		
KS 79	CROOKED CREEK	SMOLTS	CROOKED CREEK	4/14/80	51,998	708.22	NO	
H20	STOCKED TOTAL				51,998	708.22		
KS 79	CROOKED CREEK	SMOLTS	HALIBUT COVE LAGOON	5/13/80	64,042	863.57	NO	
KS 79	CROOKED CREEK	SMOLTS	HALIBUT COVE LAGOON	5/13/80	41,199	553.93	NO	
H20	STOCKED TOTAL				105,241	1,417.50		
KS 79	CROOKED CREEK	SMOLTS	SHIP CREEK	5/16/80	77,961	1,167.08	NO	
KS 79	CROOKED CREEK	SMOLTS	SHIP CREEK	5/16/80	22,230	332.78	NO	
H20	STOCKED TOTAL				100,191	1,499.86		
AGE TOTAL					257,430	3,625.58		
SPECIES TOTAL					257,430	3,625.58		
RT 80	SWANSON RIVER	FINGERLINGS	BIG NO LUCK LAKE	8/19/80	2,601	2.32	NO	
RT 80	SWANSON RIVER	FINGERLINGS	BIG NO LUCK LAKE	3/19/80	2,605	2.97	AD	
H20	STOCKED TOTAL				5,206	5.29		
RT 80	SWANSON RIVER	FINGERLINGS	BLUERERRY LAKE	9/18/80	1,950	1.61	NO	
H20	STOCKED TOTAL				1,950	1.61		
RT 80	JALADIK CREEK	FINGERLINGS	CARTER LAKE	7/30/80	9,600	11.58	NO	
H20	STOCKED TOTAL				9,600	11.58		
RT 80	SWANSON RIVER	FINGERLINGS	ECHO LAKE	8/19/80	4,600	4.24	NO	
H20	STOCKED TOTAL				4,600	4.24		
RT 80	SWANSON RIVER	FINGERLINGS	IRENE LAKE	8/21/80	3,600	3.38	NO	
H20	STOCKED TOTAL				3,600	3.38		
RT 80	SWANSON RIVER	FINGERLINGS	JOHNSON LAKE	8/15/80	2,700	2.75	RV	
RT 80	SWANSON RIVER	FINGERLINGS	JOHNSON LAKE	8/15/80	2,685	2.59	LV	
RT 80	SWANSON RIVER	FINGERLINGS	JOHNSON LAKE	8/13/80	2,650	2.88	AD	
H20	STOCKED TOTAL				8,035	8.22		
RT 80	SWANSON RIVER	FINGERLINGS	JUNCTION LAKE	8/18/80	1,085	.99	NO	
RT 80	SWANSON RIVER	FINGERLINGS	JUNCTION LAKE	8/13/80	1,085	1.26	AD	
H20	STOCKED TOTAL				2,170	2.25		
RT 80	SWANSON RIVER	FINGERLINGS	KEPLER-BRADLEY LAKE	8/12/80	5,825	6.34	LV	
RT 80	SWANSON RIVER	FINGERLINGS	KEPLER-BRADLEY LAKE	9/16/80	5,783	5.25	RV	
H20	STOCKED TOTAL				11,608	11.59		

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KAS3091 FISH PLANTED IN 1980 BY FT RICHARDSON HATCH.

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SP	BR YR	ORIGIN	STAGE	WATER STOCKED	TRIP DATE	NUMBER STOCKED	TOTAL WT IN KG	MARKS	CWTNG
RT 87	SWANSON RIVER	FINGERLINGS	KNIK LAKE	9/16/80	4,945	4.34	RV		
RT 87	SWANSON RIVER	FINGERLINGS	KNIK LAKE	8/11/80	4,920	4.65	LV		
H20	STOCKED TOTAL				9,865	8.99			
RT 87	SWANSON RIVER	FINGERLINGS	LITTLE NO LUCK LAKE	8/19/80	2,560	2.27	NO		
H20	STOCKED TOTAL				2,560	2.27			
RT 87	SWANSON RIVER	FINGERLINGS	LONG LAKE	8/18/80	5,000	4.90	RV		
RT 80	SWANSON RIVER	FINGERLINGS	LONG LAKE	8/18/80	3,570	4.81	LV		
RT 87	SWANSON RIVER	FINGERLINGS	LONG LAKE	8/15/80	4,963	5.02	AD		
H20	STOCKED TOTAL				13,533	14.73			
RT 80	SWANSON RIVER	FINGERLINGS	MARION LAKE	8/20/80	5,650	5.12	NO		
RT 80	SWANSON RIVER	FINGERLINGS	MARION LAKE	8/20/80	5,650	6.48	AD		
H20	STOCKED TOTAL				11,300	11.60			
RT 80	SWANSON RIVER	FINGERLINGS	MATANUSKA LAKE	8/12/80	6,042	6.67	LV		
RT 80	SWANSON RIVER	FINGERLINGS	MATANUSKA LAKE	9/15/80	5,995	5.14	RV		
H20	STOCKED TOTAL				12,037	11.81			
RT 80	TALARIK CREEK	FINGERLINGS	MIRROR LAKE	8/13/80	9,626	17.95	NO		
H20	STOCKED TOTAL				9,626	17.95			
RT 80	TALARIK CREEK	FINGERLINGS	MOOSE LAKE	8/13/80	8,020	14.96	NO		
H20	STOCKED TOTAL				8,020	14.96			
RT 80	SWANSON RIVER	FINGERLINGS	NORTH JANS LAKE	9/18/80	5,953	12.43	NO		
RT 80	SWANSON RIVER	FINGERLINGS	NORTH JANS LAKE	9/18/80	7,914	6.45	NO		
H20	STOCKED TOTAL				13,867	18.88			
RT 80	TALARIK CREEK	FINGERLINGS	OLD ROAD LAKE	8/13/80	732	1.36	NO		
H20	STOCKED TOTAL				732	1.36			
RT 87	SWANSON RIVER	FINGERLINGS	RAVINE LAKE	8/19/80	1,230	1.12	NO		
RT 87	SWANSON RIVER	FINGERLINGS	RAVINE LAKE	8/19/80	1,230	1.36	AD		
H20	STOCKED TOTAL				2,460	2.48			
RT 80	TALARIK CREEK	FINGERLINGS	ROUND LAKE	8/13/80	732	1.36	NO		
H20	STOCKED TOTAL				732	1.36			
RT 87	SWANSON RIVER	FINGERLINGS	SEYMOUR LAKE	8/21/80	22,900	21.55	NO		
H20	STOCKED TOTAL				22,900	21.55			
RT 87	SWANSON RIVER	FINGERLINGS	SLIVER	8/19/80	1,000	.91	NO		
RT 80	SWANSON RIVER	FINGERLINGS	SLIVER	8/19/80	1,000	1.18	AD		
H20	STOCKED TOTAL				2,000	2.09			
RT 80	TALARIK CREEK	FINGERLINGS	VAGT LAKE	7/30/80	8,600	10.37	NO		
H20	STOCKED TOTAL				8,600	10.37			
RT 80	SWANSON RIVER	FINGERLINGS	WORTHINGTON LAKE	9/18/80	3,950	3.22	NO		
H20	STOCKED TOTAL				3,950	3.22			

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## KRY3081 FISH PLANTED IN 1980 BY FT RICHARDSON HATCH.

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SR YR	ORIGIN	STAGE	WATER STOCKED	TRIP DATE	NUMBER STOCKED	TOTAL WT IN KG	MARKS	CWTND
RT 87	TALARIK CREEK	FINGERLINGS	SQUIRREL CREEK	8/13/80	2,253	4.22	NO	
H20 STOCKED TOTAL					2,253	4.22		
RT 87	SWANSON RIVER	FINGERLINGS	X LAKE	8/20/80	12,750	11.80	NO	
H20 STOCKED TOTAL					12,750	11.80		
RT 80	SWANSON RIVER	FINGERLINGS	Y LAKE	8/20/80	2,750	2.45	NO	
RT 87	SWANSON RIVER	FINGERLINGS	Y LAKE	8/20/80	2,750	3.15	AD	
H20 STOCKED TOTAL					5,500	5.60		
RT 80	SWANSON RIVER	FINGERLINGS	SHALLOW LAKE	8/26/80	2,500	3.33	NO	
H20 STOCKED TOTAL					2,500	3.33		
RT 79	SWANSON RIVER	FINGERLINGS	BIRCH LAKE	8/05/80	5,074	124.70	AD	
RT 72	SWANSON RIVER	FINGERLINGS	BIRCH LAKE	5/22/80	50,000	1,256.09	NO	
H20 STOCKED TOTAL					55,074	1,380.79		
RT 80	TALARIK CREEK	FINGERLINGS	BLUFF CABIN LAKE	7/23/80	4,995	5.48	NO	
H20 STOCKED TOTAL					4,995	5.48		
RT 80	TALARIK CREEK	FINGERLINGS	DONNA LAKE	7/23/80	4,995	5.48	NO	
H20 STOCKED TOTAL					4,995	5.48		
RT 83	TALARIK CREEK	FINGERLINGS	KOOLE LAKE	7/23/80	42,927	47.10	NO	
H20 STOCKED TOTAL					42,927	47.10		
RT 80	TALARIK CREEK	FINGERLINGS	LISA LAKE	7/23/80	4,533	5.00	NO	
H20 STOCKED TOTAL					4,533	5.00		
RT 80	TALARIK CREEK	FINGERLINGS	MARK LAKE	7/23/80	1,995	2.19	NO	
H20 STOCKED TOTAL					1,995	2.19		
RT 80	SWANSON RIVER	FINGERLINGS	QUARTZ LAKE	8/28/80	87,559	107.03	NO	
H20 STOCKED TOTAL					87,559	107.03		
RT 87	TALARIK CREEK	FINGERLINGS	RAPID LAKE	7/23/80	500	.54	NO	
H20 STOCKED TOTAL					500	.54		
RT 80	SWANSON RIVER	FINGERLINGS	ABERCROMBIE LAKE	8/21/80	3,695	3.67	AD	
H20 STOCKED TOTAL					3,695	3.67		
RT 80	TALARIK CREEK	FINGERLINGS	AUREL LAKE	7/17/80	3,000	2.72	NO	
H20 STOCKED TOTAL					3,000	2.72		
RT 80	SWANSON RIVER	FINGERLINGS	BOY SCOUT LAKE	8/21/80	800	.79	AD	
RT 87	SWANSON RIVER	FINGERLINGS	BOY SCOUT LAKE	8/21/80	800	.79	NO	
H20 STOCKED TOTAL					1,600	1.58		
RT 80	TALARIK CREEK	FINGERLINGS	BEAVER POND	7/17/80	600	.54	NO	
H20 STOCKED TOTAL					600	.54		
RT 80	TALARIK CREEK	FINGERLINGS	BIG LAKE	7/17/80	3,600	3.26	NO	
H20 STOCKED TOTAL					3,600	3.26		

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## K993081 FISH PLANTED IN 1980 BY FT RICHARDSON HATCH.

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SR YR.	ORIGIN.	STAGE	WATER STOCKED	TRIP DATE	NUMBER STOCKED	TOTAL WT IN KG	MARKS	CWTNO.
RT 87	SWANSON RIVER	FINGERLINGS	BULL LAKE	8/21/80	1,432	1.49	LV	
RT 88	SWANSON RIVER	FINGERLINGS	BULL LAKE	8/21/80	1,495	1.49	RV	
H20	STOCKED TOTAL				2,927	2.98		
RT 86	TALARIK CREEK	FINGERLINGS	CAROLINE LAKE	7/17/80	1,400	1.27	NO	
H20	STOCKED TOTAL				1,400	1.27		
RT 87	TALARIK CREEK	FINGERLINGS	CASCADE LAKE	7/17/80	1,600	1.45	NO	
H20	STOCKED TOTAL				1,600	1.45		
RT 89	TALARIK CREEK	FINGERLINGS	CICELY LAKE	7/17/80	1,200	1.08	NO	
H20	STOCKED TOTAL				1,200	1.08		
RT 87	SWANSON RIVER	FINGERLINGS	DOLGOI LAKE	8/21/80	3,594	3.58	AD	
H20	STOCKED TOTAL				3,594	3.58		
RT 89	SWANSON RIVER	FINGERLINGS	DRAGONFLY LAKE	8/21/80	1,647	1.64	AD	
H20	STOCKED TOTAL				1,647	1.64		
RT 89	TALARIK CREEK	FINGERLINGS	HEITMAN LAKE	7/17/80	3,000	2.72	NO	
H20	STOCKED TOTAL				3,000	2.72		
RT 89	TALARIK CREEK	FINGERLINGS	HORSESHOE LAKE	7/17/80	1,000	.90	NO	
H20	STOCKED TOTAL				1,000	.90		
RT 89	TALARIK CREEK	FINGERLINGS	JACK LAKE	7/17/80	1,000	.90	NO	
H20	STOCKED TOTAL				1,000	.90		
RT 89	SWANSON RIVER	FINGERLINGS	LFE LAKE	8/21/80	2,798	2.78	AD	
H20	STOCKED TOTAL				2,798	2.78		
RT 89	SWANSON RIVER	FINGERLINGS	LILLY POND	8/21/80	500	.49	LV	
RT 89	SWANSON RIVER	FINGERLINGS	LILLY POND	8/21/80	500	.49	RV	
H20	STOCKED TOTAL				1,000	.98		
RT 89	SWANSON RIVER	FINGERLINGS	LONG LAKE	8/21/80	2,697	2.77	KV	
RT 89	SWANSON RIVER	FINGERLINGS	LONG LAKE	8/21/80	2,718	2.72	LV	
H20	STOCKED TOTAL				5,415	5.49		
RT 89	TALARIK CREEK	FINGERLINGS	LUPINE LAKE	7/17/80	1,600	1.45	NO	
H20	STOCKED TOTAL				1,600	1.45		
RT 89	TALARIK CREEK	FINGERLINGS	MAYFLOWER LAKE	7/17/80	2,360	2.14	NO	
H20	STOCKED TOTAL				2,360	2.14		
RT 89	TALARIK CREEK	FINGERLINGS	ORBIN LAKE	7/17/80	3,000	2.72	NO	
H20	STOCKED TOTAL				3,000	2.72		
RT 89	SWANSON RIVER	FINGERLINGS	TANIGNAK LAKE	8/21/80	5,476	5.57	NO	
H20	STOCKED TOTAL				5,476	5.57		
AGE TOTAL					446,044	1,819.76		

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## FISH PLANTED IN 1980 BY FT RICHARDSON HATCH.

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SP YR	ORIGIN	STAGE	WATER STOCKED	TRIP DATE	NUMBER STOCKED	TOTAL WT IN KG	MARKS	COMING
RT 79	TALARIK CREEK	CATCHABLES	CAMPBELL POINT LAKE	6/17/80	4,987	394.09	NO	
H20 STOCKED TOTAL					4,987	394.09		
RT 79	TALARIK CREEK	CATCHABLES	CLUNIE LAKE	6/16/80	10,275	803.56	NO	
H20 STOCKED TOTAL					10,275	803.56		
RT 79	TALARIK CREEK	CATCHABLES	GREEN LAKE	6/16/80	2,593	206.74	NO	
RT 79	TALARIK CREEK	CATCHABLES	GREEN LAKE	6/16/80	2,420	189.25	NO	
H20 STOCKED TOTAL					5,013	395.99		
RT 79	TALARIK CREEK	CATCHABLES	JEWEL LAKE	6/17/80	4,987	394.09	NO	
RT 79	TALARIK CREEK	CATCHABLES	JEWEL LAKE	6/20/80	519	41.01	NO	
H20 STOCKED TOTAL					5,506	435.10		
RT 79	TALARIK CREEK	CATCHABLES	LOWER EIKE LAKE	6/17/80	5,011	395.98	NO	
H20 STOCKED TOTAL					5,011	395.98		
RT 79	TALARIK CREEK	CATCHABLES	OTTER LAKE	6/16/80	10,931	869.86	NO	
H20 STOCKED TOTAL					10,931	869.86		
RT 79	TALARIK CREEK	CATCHABLES	SAND LAKE	6/17/80	5,011	395.98	NO	
H20 STOCKED TOTAL					5,011	395.98		
AGE TOTAL					46,734	3,690.56		
RT 79	SWANSON RIVER	BROOD STOCK	BEACH LAKE	6/06/80	8	10.88	NO	
H20 STOCKED TOTAL					8	10.88		
RT 79	SWANSON RIVER	BROOD STOCK	DERBY POND	6/27/80	10	15.87	NO	
H20 STOCKED TOTAL					10	15.87		
RT 79	SWANSON RIVER	BROOD STOCK	JEWEL LAKE	5/22/80	75	85.04	NO	
RT 79	SWANSON RIVER	BROOD STOCK	JEWEL LAKE	5/22/80	100	113.39	NO	
H20 STOCKED TOTAL					175	198.43		
AGE TOTAL					193	225.18		
SPECIES TOTAL					492,971	5,735.50		
SS 79	SEWARD LAGOON	FINGERLINGS	PEAR LAKE	6/12/80	44,362	81.65	NO	
SS 79	SEWARD LAGOON	FINGERLINGS	PEAR LAKE	6/12/80	43,575	81.64	NO	
SS 79	SEWARD LAGOON	FINGERLINGS	PEAR LAKE	5/12/80	46,438	82.46	NO	
SS 79	SEWARD LAGOON	FINGERLINGS	PEAR LAKE	6/18/80	15,636	30.75	NO	
H20 STOCKED TOTAL					150,011	276.50		
SS 79	SEWARD LAGOON	FINGERLINGS	FINGER LAKE	6/19/80	7,286	14.32	NO	
SS 79	SEWARD LAGOON	FINGERLINGS	FINGER LAKE	5/07/80	36,891	119.30	NO	
H20 STOCKED TOTAL					44,177	133.62		
SS 79	SEWARD LAGOON	FINGERLINGS	KEPLER-BRADLEY LAKE	6/19/80	2,800	5.50	NO	
H20 STOCKED TOTAL					2,800	5.50		

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## FISH PLANTED IN 1980 BY FT RICHARDSON HATCH.

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BR SP. YR	ORIGIN	STAGE	WATER STOCKED	TRIP DATE	NUMBER STOCKED	TOTAL WT IN KG	MARKS	CWIND
SS 79 SEWARD LAGOON		FINGERLINGS	MEMORY LAKE	5/07/80	8,285	14.78	NO	
H20 STOCKED TOTAL					8,285	14.78		
SS 79 SHIP CREEK		FINGERLINGS	BIRCH LAKE	5/27/80	4,787	13.52	NO	
SS 79 SEWARD LAGOON		FINGERLINGS	BIRCH LAKE	5/27/80	55,063	156.04	NO	
H20 STOCKED TOTAL					59,850	169.56		
SS 79 SHIP CREEK		FINGERLINGS	DONNELLY CREEK POND	5/27/80	9,984	20.96	NO	
H20 STOCKED TOTAL					9,984	20.96		
SS 79 SHIP CREEK		FINGERLINGS	LOST LAKE	5/27/80	19,990	41.82	NO	
H20 STOCKED TOTAL					19,990	41.82		
SS 79 SHIP CREEK		FINGERLINGS	SOUTH TWIN LAKE	5/27/80	4,990	10.46	NO	
H20 STOCKED TOTAL					4,990	10.46		
SS 79 SEWARD LAGOON		FINGERLINGS	GESKAKMINA	5/27/80	2,926	4.54	NO	
SS 79 SHIP CREEK		FINGERLINGS	GESKAKMINA	5/27/80	17,074	26.49	NO	
H20 STOCKED TOTAL					20,000	31.03		
SS 79 SEWARD LAGOON		FINGERLINGS	SOUTHERN LAKE	5/28/80	3,500	4.76	NO	
H20 STOCKED TOTAL					3,500	4.76		
AGE TOTAL					323,587	708.99		
SS 78 SEWARD LAGOON		CATCHABLES	BEACH LAKE	6/06/80	1,238	115.31	NO	
SS 78 SEWARD LAGOON		CATCHABLES	BEACH LAKE	6/06/80	1,228	114.37	NO	
SS 78 SEWARD LAGOON		CATCHABLES	BEACH LAKE	6/06/80	1,225	114.09	NO	
SS 78 SEWARD LAGOON		CATCHABLES	BEACH LAKE	6/06/80	1,230	114.56	NO	
H20 STOCKED TOTAL					4,921	458.33		
SS 78 SEWARD LAGOON		CATCHABLES	"C" ST GRAVEL PIT	5/21/80	5,014	413.51	NO	
H20 STOCKED TOTAL					5,014	413.51		
SS 78 SEWARD LAGOON		CATCHABLES	CHENY POND	5/21/80	5,014	413.51	NO	
H20 STOCKED TOTAL					5,014	413.51		
SS 78 SEWARD LAGOON		CATCHABLES	DELONG LAKE	5/21/80	5,000	412.35	NO	
H20 STOCKED TOTAL					5,000	412.35		
SS 78 SEWARD LAGOON		CATCHABLES	DERBY POND	6/27/80	718	78.85	NO	
SS 78 SEWARD LAGOON		CATCHABLES	DERBY POND	7/24/80	300	69.02	NO	
H20 STOCKED TOTAL					1,018	146.67		
SS 78 SEWARD LAGOON		CATCHABLES	FISH LAKE	5/21/80	1,135	93.60	NO	
SS 78 SEWARD LAGOON		CATCHABLES	FISH LAKE	5/21/80	1,845	152.16	NO	
H20 STOCKED TOTAL					2,980	245.76		
SS 78 SEWARD LAGOON		CATCHABLES	GWEN LAKE	5/20/80	7,943	680.65	NO	
H20 STOCKED TOTAL					7,943	680.65		
SS 78 SEWARD LAGOON		CATCHABLES	HILLBFG LAKE	5/20/80	7,973	710.00	NO	
H20 STOCKED TOTAL					7,973	710.00		

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## K193081 FISH PLANTED IN 1980 BY FT RICHARDSON HATCHERY

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SP YR	ORIGIN	STAGE	WATER STOCKED	TRIP DATE	NUMBER STOCKED	TOTAL WT IN KG	MARKS	CWNO
SS 73	SEWARD LAGOON	CATCHABLES	MIRROR LAKE	5/21/80	4,994	413.51	NO	
SS 78	SEWARD LAGOON	CATCHABLES	MIRROR LAKE	7/24/80	903	204.76	NO	
H20 STOCKED TOTAL						5,897	618.27	
SS 78	SEWARD LAGOON	CATCHABLES	6-MILE LAKE	5/20/80	5,747	473.96	NO	
H20 STOCKED TOTAL						5,747	473.96	
SS 73	SEWARD LAGOON	CATCHABLES	THOMPSON LAKE	5/20/80	192	15.83	NO	
SS 73	SEWARD LAGOON	CATCHABLES	THOMPSON LAKE	5/20/80	2,345	183.39	NO	
H20 STOCKED TOTAL						2,537	199.22	
SS 74	SEWARD LAGOON	CATCHABLES	TRIANGLE LAKE	5/20/80	2,348	187.25	NO	
H20 STOCKED TOTAL						2,348	187.25	
AGE TOTAL						56,392	4,959.68	
SS 79	SEWARD LAGOON	SMOLTS	FRITZ CREEK	6/26/80	14,802	224.55	ADCW	A42009
SS 79	SEWARD LAGOON	SMOLTS	FRITZ CREEK	6/26/80	6,513	98.80	ADCW	A42010
H20 STOCKED TOTAL						21,315	323.35	
SS 79	SEWARD LAGOON	SMOLTS	GROUSE LAKE	6/26/80	34,773	463.90	NO	
H20 STOCKED TOTAL						34,773	463.90	
SS 79	SEWARD LAGOON	SMOLTS	SEWARD LAGOON	6/25/80	70,824	823.14	NO	
SS 79	SEWARD LAGOON	SMOLTS	SEWARD LAGOON	6/26/80	3,198	37.05	NO	
SS 79	SEWARD LAGOON	SMOLTS	SEWARD LAGOON	6/25/80	70,824	823.14	NO	
SS 74	SEWARD LAGOON	SMOLTS	SEWARD LAGOON	6/25/80	26,735	310.06	ADCW	A42007
H20 STOCKED TOTAL						171,581	1,993.39	
SS 79	SEWARD LAGOON	SMOLTS	COVE CREEK	6/30/80	9,330	136.07	NO	
SS 79	SEWARD LAGOON	SMOLTS	COVE CREEK	6/30/80	14,706	216.05	NO	
SS 79	SEWARD LAGOON	SMOLTS	COVE CREEK	6/30/80	28,021	382.33	ADCW	A42006
H20 STOCKED TOTAL						50,057	734.45	
AGE TOTAL						277,726	3,515.09	
SPECIES TOTAL						657,705	9,183.76	
HATCHERY TOTAL						1,459,378	18,545.40	



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KR93081 FISH PLANTED IN 1980 BY ELMENDORF HATCHERY

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SP	BR YR	ORIGIN	STAGE	WATER STOCKED	TRIP DATE	NUMBER STOCKED	TOTAL WT IN KG	MARKS	CWIND
KS	79	CROOKED CREEK	SMOLTS	HALIBUT COVE LAGOON	5/03/80	30,388	485.33	ADCW	A42013
KS	79	CROOKED CREEK	SMOLTS	HALIBUT COVE LAGOON	5/13/80	19,425	310.24	ADCW	A42013
H20 STOCKED TOTAL						49,813	795.57		
KS	79	CROOKED CREEK	SMOLTS	SHIP CREEK	5/29/80	49,660	866.37	ADCW	A42012
KS	79	CROOKED CREEK	SMOLTS	SHIP CREEK	5/29/80	51,407	728.68	NO	
H20 STOCKED TOTAL						101,067	1,595.05		
AGE TOTAL						150,880	2,390.62		
SPECIES TOTAL						150,880	2,390.62		
HATCHERY TOTAL						150,880	2,390.62		

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FISH PLANTED IN 1980 BY CRYSTAL LAKE HATCH.

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BR	SP. YR.	ORIGIN	STAGE	WATER STOCKED	TRIP DATE	NUMBER STOCKED	TOTAL WT IN KG	MARKS	CWTNO
KS	79	ANDREWS CREEK	SMOLTS	CRYSTAL CREEK	5/23/80	12,965	106.83	ADRV	041927
KS	79	ANDREWS CREEK	SMOLTS	CRYSTAL CREEK	5/23/80	711	5.86	ADRV	
H2O STOCKED TOTAL						13,676	112.69		
AGE TOTAL						13,676	112.69		
SPECIES TOTAL						13,676	112.69		
SS	79	DUNCAN SALT CHUCK CR	SMOLTS	CRYSTAL CREEK	5/30/80	5,016	47.40	RV	
SS	79	CRYSTAL CREEK	SMOLTS	CRYSTAL CREEK	6/03/80	33,276	263.55	NO	
SS	79	CRYSTAL CREEK	SMOLTS	CRYSTAL CREEK	6/03/80	13,276	105.15	RV	
SS	79	CRYSTAL CREEK	SMOLTS	CRYSTAL CREEK	6/03/80	201	1.59	AO	
SS	78	DUNCAN SALT CHUCK CR	SMOLTS	CRYSTAL CREEK	5/23/80	535	16.08	ADRV	
SS	73	DUNCAN SALT CHUCK CR	SMOLTS	CRYSTAL CREEK	5/23/80	9,565	287.52	ADRV	041901
SS	72	CRYSTAL CREEK	SMOLTS	CRYSTAL CREEK	6/03/80	10,366	82.10	ADRV	041755
SS	78	DUNCAN SALT CHUCK CR	SMOLTS	CRYSTAL CREEK	5/23/80	869	26.12	RV	
SS	79	DUNCAN SALT CHUCK CR	SMOLTS	CRYSTAL CREEK	5/30/80	188	1.78	AD	
SS	79	DUNCAN SALT CHUCK CR	SMOLTS	CRYSTAL CREEK	5/30/80	10,264	96.99	ADRV	041902
H2O STOCKED TOTAL						83,556	928.28		
AGE TOTAL						83,556	928.28		
SPECIES TOTAL						83,556	928.28		
HATCHERY TOTAL						97,232	1,040.97		

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KR93081 FISH PLANTED IN 1980 BY BEAVER FALLS

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SP	BR	ORIGIN	STAGE	WATER STOCKED	TRIP DATE	NUMBER STOCKED	TOTAL WT IN KG	MARKS	CMTNG
CS	79	BEAVER FALLS	FEED FRY	GEORGE INLET	4/29/80	255,894	95.70	NO	
CS	79	BEAVER FALLS	FEED FRY	GEORGE INLET	5/28/80	216,247	87.09	NO	
CS	79	BEAVER FALLS	FEED FRY	GEORGE INLET	5/16/80	244,248	96.58	NO	
CS	79	BEAVER FALLS	FEED FRY	GEORGE INLET	5/01/80	243,450	94.40	NO	
CS	79	BEAVER FALLS	FEED FRY	GEORGE INLET	6/12/80	65,886	30.87	NO	
CS	79	BEAVER FALLS	FEED FRY	GEORGE INLET	5/13/80	235,014	87.66	NO	
CS	79	BEAVER FALLS	FEED FRY	GEORGE INLET	4/18/80	350,731	132.60	NO	
CS	79	BEAVER FALLS	FEED FRY	GEORGE INLET	6/01/80	1,000	.44	NO	
CS	79	BEAVER FALLS	FEED FRY	GEORGE INLET	7/18/80	243	.37	NO	
CS	79	BEAVER FALLS	FEED FRY	GEORGE INLET	4/16/80	253,046	106.28	NO	
CS	79	BEAVER FALLS	FEED FRY	GEORGE INLET	3/27/80	682	.29	NO	
HATCHERY STOCKED TOTAL						1,866,448	732.28		
AGE TOTAL						1,866,448	732.28		
SPECIES TOTAL						1,866,448	732.28		
HATCHERY TOTAL						1,866,448	732.28		

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## K293081 FISH PLANTED IN 1980 BY KLAUOCK HATCHERY

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SP	PR YA	ORIGIN	STAGE	WATER STOCKED	TRIP DATE	NUMBER STOCKED	TOTAL WT IN KG	MARKS	CWTNO
CS	79	KLAUOCK RIVER	FINGERLINGS	KLAUOCK RIVER	5/20/80	780	.95	NO	
CS	79	KLAUOCK RIVER	FINGERLINGS	KLAUOCK RIVER	5/20/80	13,750	18.70	ADCH	040107
CS	79	KLAUOCK RIVER	FINGERLINGS	KLAUOCK RIVER	5/20/80	1,504	1.84	NO	
CS	79	KLAUOCK RIVER	FINGERLINGS	KLAUOCK RIVER	5/15/80	15,710	19.14	NO	
CS	79	KLAUOCK RIVER	FINGERLINGS	KLAUOCK RIVER	5/13/80	12,508	15.24	NO	
CS	79	KLAUOCK RIVER	FINGERLINGS	KLAUOCK RIVER	5/15/80	30,294	36.92	NO	
CS	79	KLAUOCK RIVER	FINGERLINGS	KLAUOCK RIVER	5/20/80	1,494	2.03	AD	
CS	79	KLAUOCK RIVER	FINGERLINGS	KLAUOCK RIVER	5/20/80	256	.31	NO	
CS	79	KLAUOCK RIVER	FINGERLINGS	KLAUOCK RIVER	5/15/80	5,169	6.30	NO	
CS	79	KLAUOCK RIVER	FINGERLINGS	KLAUOCK RIVER	5/19/80	1,775	1.05	AD	
CS	79	KLAUOCK RIVER	FINGERLINGS	KLAUOCK RIVER	5/13/80	24,120	29.39	NO	
CS	79	KLAUOCK RIVER	FINGERLINGS	KLAUOCK RIVER	5/19/80	7,137	9.71	ADCH	040401
CS	79	KLAUOCK RIVER	FINGERLINGS	KLAUOCK RIVER	5/20/80	2,337	3.18	ADCH	040402
CS	79	KLAUOCK RIVER	FINGERLINGS	KLAUOCK RIVER	5/13/80	4,115	5.02	NO	
CS	79	KLAUOCK RIVER	FINGERLINGS	KLAUOCK RIVER	5/20/80	254	.35	AD	
H20 STOCKED TOTAL						120,203	150.13		
AGE TOTAL						120,203	150.13		
SPECIES TOTAL						120,203	150.13		
RS	79	KLAUOCK LAKE	SWIMUP FRY	KLAUOCK RIVER	6/05/80	6,000	2.04	NO	
H20 STOCKED TOTAL						6,000	2.04		
AGE TOTAL						6,000	2.04		
RS	79	KLAUOCK LAKE	FEED FRY	KLAUOCK LAKE	7/15/80	12,364	11.63	NO	
H20 STOCKED TOTAL						12,364	11.63		
AGE TOTAL						12,364	11.63		
SPECIES TOTAL						18,364	13.67		
SH	79	KLAUOCK RIVER	SMOLTS	KLAUOCK RIVER	6/02/80	2,055	93.30	ADCH	041756
SH	79	KLAUOCK RIVER	SMOLTS	KLAUOCK RIVER	6/02/80	2,553	25.11	AD	
H20 STOCKED TOTAL						2,608	118.41		
AGE TOTAL						2,608	118.41		
SPECIES TOTAL						2,608	118.41		
SS	79	KLAUOCK RIVER	SMOLTS	KLAUOCK RIVER	6/02/80	453	10.28	AD	
SS	79	KLAUOCK RIVER	SMOLTS	KLAUOCK RIVER	6/02/80	12,866	292.06	ADCH	041928
H20 STOCKED TOTAL						13,319	302.34		
AGE TOTAL						13,319	302.34		
SPECIES TOTAL						13,319	302.34		
HATCHERY TOTAL						154,494	584.55		

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## KR93081 FISH PLANTED IN 1980 BY HIDDEN FALLS HATCH

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SP	BR YR	ORIGIN	STAGE	WATER STOCKED	TRIP DATE	NUMBER STOCKED	TOTAL WT IN KG	MARKS	CHINO
CS	79	CLEAR RIVER	FINGERLINGS	KASNYKU BAY	5/14/80	52,675	52.53	NO	
CS	79	CLEAR RIVER	FINGERLINGS	KASNYKU BAY	5/20/80	49,390	132.10	NO	
CS	79	KADASHAM RIVER	FINGERLINGS	KASNYKU BAY	5/17/80	220,629	336.50	NO	
CS	79	KADASHAM RIVER	FINGERLINGS	KASNYKU BAY	5/20/80	266,535	401.00	NO	
CS	79	KADASHAM RIVER	FINGERLINGS	KASNYKU BAY	5/17/80	235,298	383.80	NO	
CS	79	KADASHAM RIVER	FINGERLINGS	KASNYKU BAY	5/16/80	28,565	44.24	NO	
CS	79	KADASHAM RIVER	FINGERLINGS	KASNYKU BAY	5/15/80	264,763	454.66	NO	
CS	79	KADASHAM RIVER	FINGERLINGS	KASNYKU BAY	5/20/80	420,325	953.10	NO	
CS	79	CLEAR RIVER	FINGERLINGS	KASNYKU BAY	5/16/80	25,779	45.97	NO	
CS	79	KADASHAM RIVER	FINGERLINGS	KASNYKU BAY	5/19/80	256,285	410.10	NO	
CS	79	KADASHAM RIVER	FINGERLINGS	KASNYKU BAY	5/18/80	269,317	421.10	NO	
CS	79	KADASHAM RIVER	FINGERLINGS	KASNYKU BAY	5/19/80	96,236	241.00	NO	
CS	79	KADASHAM RIVER	FINGERLINGS	KASNYKU BAY	5/16/80	27,365	37.50	NO	
CS	79	KADASHAM RIVER	FINGERLINGS	KASNYKU BAY	5/16/80	28,021	41.76	NO	
CS	79	KADASHAM RIVER	FINGERLINGS	KASNYKU BAY	5/16/80	33,211	50.70	NO	
CS	79	KADASHAM RIVER	FINGERLINGS	KASNYKU BAY	4/18/80	163,400	196.20	NO	
CS	79	KADASHAM RIVER	FINGERLINGS	KASNYKU BAY	5/20/80	10,226	23.11	ADCW	040206
CS	79	KADASHAM RIVER	FINGERLINGS	KASNYKU BAY	5/16/80	29,570	43.10	NO	
CS	79	KADASHAM RIVER	FINGERLINGS	KASNYKU BAY	5/18/80	78	.12	AD	
CS	79	KADASHAM RIVER	FINGERLINGS	KASNYKU BAY	5/18/80	12,914	20.39	ADCW	040201
CS	79	KADASHAM RIVER	FINGERLINGS	KASNYKU BAY	5/19/80	682,591	1,494.60	NO	
CS	79	KADASHAM RIVER	FINGERLINGS	KASNYKU BAY	4/18/80	374,000	437.90	NO	
CS	79	CLEAR RIVER	FINGERLINGS	KASNYKU BAY	5/15/80	1,510	2.33	ADCW	040205
CS	79	CLEAR RIVER	FINGERLINGS	KASNYKU BAY	5/20/80	11,984	18.26	NO	
CS	79	KADASHAM RIVER	FINGERLINGS	KASNYKU BAY	5/20/80	62	.14	AD	
CS	79	CLEAR RIVER	FINGERLINGS	KASNYKU BAY	5/16/80	34	.05	AD	
CS	79	CLEAR RIVER	FINGERLINGS	KASNYKU BAY	5/20/80	12,056	19.86	NO	
CS	79	CLEAR RIVER	FINGERLINGS	KASNYKU BAY	5/16/80	28,065	47.36	NO	
H20 STOCKED TOTAL						3,599,384	6,309.48		
AGE TOTAL						3,599,384	6,309.48		
SPECIES TOTAL						3,599,384	6,309.48		
HATCHERY TOTAL						3,599,384	6,309.48		

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KRY3081

FISH PLANTED IN 1980 BY SNETTISHAM HATCHERY.

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BR SP YR	ORIGIN	STAGE	WATER STOCKED	TRIP DATE	NUMBER STOCKED	TOTAL WT IN KG	MARKS	CHIND
CS 79	LIMESTONE CREEK	SWIMUP FRY	PORT SNETTISHAM	2/14/80	17,185	7.36	NO	
H20 STOCKED TOTAL					17,185	7.36		
AGE TOTAL					17,185	7.36		
CS 79	LIMESTONE CREEK	FINGERLINGS	PORT SNETTISHAM	4/30/80	143,603	155.60	NO	
CS 79	PROSPECT CREEK	FINGERLINGS	PORT SNETTISHAM	4/30/80	5,848	3.63	NO	
CS 79	PROSPECT CREEK	FINGERLINGS	PORT SNETTISHAM	5/14/80	31,897	30.25	NO	
H20 STOCKED TOTAL					181,348	189.48		
AGE TOTAL					181,348	189.48		
SPECIES TOTAL					198,533	196.84		
SS 78	SPEEL LAKE	SMOLTS	PORT SNETTISHAM	5/28/80	146	1.06	AD	
SS 78	SPEEL LAKE	SMOLTS	PORT SNETTISHAM	5/28/80	10,277	74.30	ADCH	041754
SS 78	SPEEL LAKE	SMOLTS	PORT SNETTISHAM	5/28/80	145,117	1,049.20	NO	
H20 STOCKED TOTAL					155,540	1,124.56		
AGE TOTAL					155,540	1,124.56		
SPECIES TOTAL					155,540	1,124.56		
HATCHERY TOTAL					354,073	1,321.40		

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KRY3081 FISH PLANTED IN 1980 BY DEER MTN. HATCHERY

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BR SP YR	ORIGIN	STAGE	WATER STOCKED	TRIP DATE	NUMBER STOCKED	TOTAL WT IN KG	MARKS	CWIND
KS 73	CRIPPLE CREEK	SMOLTS	KETCHIKAN CREEK	5/15/80	12,623	197.44	ADCW	041932
KS 73	CRIPPLE CREEK	SMOLTS	KETCHIKAN CREEK	5/15/80	17,948	280.73	ADCW	041940
KS 73	CRIPPLE CREEK	SMOLTS	KETCHIKAN CREEK	5/15/80	4,343	69.93	AD	
KS 73	CRIPPLE CREEK	SMOLTS	KETCHIKAN CREEK	5/15/80	17,659	276.21	ADCW	041939
KS 73	CRIPPLE CREEK	SMOLTS	KETCHIKAN CREEK	5/15/80	19,491	304.86	ADCW	041938
H20 STOCKED TOTAL					72,064	1,129.17		
AGE TOTAL					72,064	1,129.17		
SPECIES TOTAL					72,064	1,129.17		
SH 73	KETCHIKAN CREEK	SMOLTS	KETCHIKAN CREEK	6/02/80	979	29.60	ADCW	041753
SH 73	KETCHIKAN CREEK	SMOLTS	KETCHIKAN CREEK	6/02/80	46	1.40	AD	
H20 STOCKED TOTAL					1,025	31.00		
SH 73	KETCHIKAN CREEK	SMOLTS	WARD CREEK	6/02/80	518	23.50	ADCW	041905
SH 73	KETCHIKAN CREEK	SMOLTS	WARD CREEK	6/02/80	27	1.22	AD	
SH 73	KETCHIKAN CREEK	SMOLTS	WARD CREEK	6/19/80	1,178	35.62	ADCW	041909
H20 STOCKED TOTAL					1,723	60.34		
AGE TOTAL					2,748	91.34		
SPECIES TOTAL					2,748	91.34		
SS 73	KETCHIKAN CREEK	SMOLTS	KETCHIKAN CREEK	6/02/80	16,871	212.57	ADCW	041933
SS 73	KETCHIKAN CREEK	SMOLTS	KETCHIKAN CREEK	6/02/80	869	10.95	AD	
SS 73	KETCHIKAN CREEK	SMOLTS	KETCHIKAN CREEK	6/02/80	37,937	477.99	NO	
H20 STOCKED TOTAL					55,677	701.51		
AGE TOTAL					55,677	701.51		
SPECIES TOTAL					55,677	701.51		
HATCHERY TOTAL					130,489	1,922.02		

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FISH PLANTED IN 1980 BY BIG LAKE HATCHERY

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BR	SP	YR	ORIGIN	STAGE	WATER STOCKED	TRIP DATE	NUMBER STOCKED	TOTAL WT IN KG	MARKS	CWIND
RS	79		MEADOW CREEK	FEED FRY	MEADOW CREEK	4/11/80	274,559	41.99	NO	
RS	79		MEADOW CREEK	FEED FRY	MEADOW CREEK	5/01/80	3,705	.53	NO	
RS	79		MEADOW CREEK	FEED FRY	MEADOW CREEK	4/25/80	6,753	9.95	NO	
RS	79		MEADOW CREEK	FEED FRY	MEADOW CREEK	4/21/80	65,000	9.46	NO	
RS	79		MEADOW CREEK	FEED FRY	MEADOW CREEK	4/24/80	2,639	3.40	NO	
RS	79		MEADOW CREEK	FEED FRY	MEADOW CREEK	4/23/80	26,058	3.67	NO	
RS	79		MEADOW CREEK	FEED FRY	MEADOW CREEK	4/21/80	14,018	2.02	NO	
RS	79		MEADOW CREEK	FEED FRY	MEADOW CREEK	4/16/80	97,648	15.33	NO	
RS	79		MEADOW CREEK	FEED FRY	MEADOW CREEK	4/15/80	82,914	13.07	NO	
RS	79		MEADOW CREEK	FEED FRY	MEADOW CREEK	4/15/80	70,101	10.02	NO	
RS	79		MEADOW CREEK	FEED FRY	MEADOW CREEK	4/11/80	102,737	15.51	NO	
RS	79		NANCY LAKE	FEED FRY	MEADOW CREEK	6/12/80	867	.11	NO	
H20 STOCKED TOTAL							746,999	113.06		
RS	79		NANCY LAKE	FEED FRY	NANCY LAKE	6/12/80	36,979	.11	NO	
RS	79		NANCY LAKE	FEED FRY	NANCY LAKE	6/03/80	36,566	4.72	NO	
RS	79		NANCY LAKE	FEED FRY	NANCY LAKE	6/12/80	19,497	2.22	NO	
RS	79		NANCY LAKE	FEED FRY	NANCY LAKE	6/12/80	16,712	1.90	NO	
RS	79		NANCY LAKE	FEED FRY	NANCY LAKE	6/03/80	57,802	6.53	NO	
RS	79		NANCY LAKE	FEED FRY	NANCY LAKE	5/05/80	49,972	5.89	NO	
RS	79		NANCY LAKE	FEED FRY	NANCY LAKE	5/12/80	114,495	14.19	NO	
RS	79		NANCY LAKE	FEED FRY	NANCY LAKE	5/12/80	87,584	10.16	NO	
RS	79		NANCY LAKE	FEED FRY	NANCY LAKE	5/12/80	83,467	10.43	NO	
RS	79		NANCY LAKE	FEED FRY	NANCY LAKE	5/05/80	114,752	15.38	NO	
RS	79		NANCY LAKE	FEED FRY	NANCY LAKE	5/19/80	99,873	11.38	NO	
H20 STOCKED TOTAL							681,699	82.91		
AGE TOTAL							1,428,698	195.97		
SPECIES TOTAL							1,428,698	195.97		
SS	79		FISH CREEK	FEED FRY	COTTONWOOD LAKE	5/29/80	43,000	27.16	NO	
SS	79		FISH CREEK	FEED FRY	COTTONWOOD LAKE	5/29/80	4,650	2.94	RV	
SS	79		FISH CREEK	FEED FRY	COTTONWOOD LAKE	6/01/80	4,650	2.26	LV	
SS	79		FISH CREEK	FEED FRY	COTTONWOOD LAKE	6/01/80	43,025	20.92	NO	
H20 STOCKED TOTAL							95,326	53.28		
SS	79		FISH CREEK	FEED FRY	BIG LAKE	6/03/80	1,100	.67	LV	
SS	79		FISH CREEK	FEED FRY	BIG LAKE	6/23/80	14,264	8.54	NO	
SS	79		FISH CREEK	FEED FRY	BIG LAKE	6/05/80	103,314	64.55	NO	
SS	79		FISH CREEK	FEED FRY	BIG LAKE	6/04/80	5,105	3.32	LV	
SS	79		FISH CREEK	FEED FRY	BIG LAKE	6/04/80	91,777	59.64	NO	
SS	79		FISH CREEK	FEED FRY	BIG LAKE	6/06/80	43,436	16.98	NO	
SS	79		FISH CREEK	FEED FRY	BIG LAKE	6/06/80	2,535	.91	LV	
SS	79		FISH CREEK	FEED FRY	BIG LAKE	6/06/80	51,265	18.50	LV	
SS	79		FISH CREEK	FEED FRY	BIG LAKE	6/05/80	5,705	3.13	LV	
SS	79		FISH CREEK	FEED FRY	BIG LAKE	6/11/80	6,092	4.04	LV	
SS	79		FISH CREEK	FEED FRY	BIG LAKE	6/11/80	124,634	82.77	NO	
H20 STOCKED TOTAL							448,327	263.05		
SS	79		FISH CREEK	FEED FRY	NIKLA SON LAKE	5/29/80	1,350	.85	RV	
SS	79		FISH CREEK	FEED FRY	NIKLA SON LAKE	5/30/80	1,350	.66	LV	



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## K993091 FISH PLANTED IN 1980 BY BIG LAKE HATCHERY

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BR SR YR	ORIGIN	STAGE	WATER STOCKED	TRIP DATE	NUMBER STOCKED	TOTAL WT IN KG	MARKS	CWTAG
SS 79	FISH CREEK	FEED FRY	NIKLASON LAKE	5/30/80	11,992	5.83	NO	
SS 79	FISH CREEK	FEED FRY	NIKLASON LAKE	5/29/80	12,005	7.58	NO	
H20 STOCKED TOTAL						24,697	14.92	
SS 79	FISH CREEK	FEED FRY	VAN LAKE	6/06/80	2,500	.98	LV	
H20 STOCKED TOTAL						2,500	.98	
SS 79	FISH CREEK	FEED FRY	WASILLA LAKE	5/29/80	5,850	3.69	RV	
SS 79	FISH CREEK	FEED FRY	WASILLA LAKE	5/29/80	54,965	34.72	NO	
SS 79	FISH CREEK	FEED FRY	WASILLA LAKE	6/03/80	5,850	3.03	LV	
SS 79	FISH CREEK	FEED FRY	WASILLA LAKE	6/03/80	55,014	28.45	NO	
H20 STOCKED TOTAL						121,679	69.89	
SS 79	FISH CREEK	FEED FRY	CORNELIUS LAKE	5/29/80	750	.47	RV	
SS 79	FISH CREEK	FEED FRY	CORNELIUS LAKE	5/29/80	7,004	4.42	NO	
SS 79	FISH CREEK	FEED FRY	CORNELIUS LAKE	5/30/80	6,994	3.40	NO	
SS 79	FISH CREEK	FEED FRY	CORNELIUS LAKE	5/30/80	750	.36	LV	
H20 STOCKED TOTAL						15,498	8.65	
SS 79	FISH CREEK	FEED FRY	ANDERSON LAKE	5/30/80	2,400	1.17	LV	
SS 79	FISH CREEK	FEED FRY	ANDERSON LAKE	5/30/80	22,978	11.17	NO	
SS 79	FISH CREEK	FEED FRY	ANDERSON LAKE	5/29/80	2,400	1.52	RV	
SS 79	FISH CREEK	FEED FRY	ANDERSON LAKE	5/29/80	23,019	14.54	NO	
H20 STOCKED TOTAL						50,797	28.40	
AGE TOTAL					760,824	439.17		
SPECIES TOTAL					760,824	439.17		
HATCHERY TOTAL					2,189,522	635.14		

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FISH PLANTED IN 1980 BY TUTKA LAGOON HATCH.

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BR SP YR	ORIGIN	STAGE	WATER STOCKED	TRIP DATE	NUMBER STOCKED	TOTAL WT IN KG	MARKS	CWIND
PS 79	TUTKA BAY LAGOON CR	SWIMUP FRY	PAINT RIVER	5/10/80	550,141	116.06	ADLV	
H20 STOCKED TOTAL					550,141	116.06		
PS 79	TUTKA BAY LAGOON CR	SWIMUP FRY	TUTKA BAY LAGOON CR	4/08/80	4,618	.95	NO	
PS 79	TUTKA BAY LAGOON CR	SWIMUP FRY	TUTKA BAY LAGOON CR	4/09/80	4,108	.87	NO	
PS 79	TUTKA BAY LAGOON CR	SWIMUP FRY	TUTKA BAY LAGOON CR	4/07/80	4,990	1.07	NO	
H20 STOCKED TOTAL					13,716	2.89		
PS 79	TUTKA BAY LAGOON CR	SWIMUP FRY	TUTKA BAY	6/03/80	1,778,603	710.76	RV	
PS 79	TUTKA BAY LAGOON CR	SWIMUP FRY	TUTKA BAY	5/31/80	1,222,855	520.29	RV	
PS 79	TUTKA BAY LAGOON CR	SWIMUP FRY	TUTKA BAY	4/18/80	31,818	6.76	NO	
PS 79	TUTKA BAY LAGOON CR	SWIMUP FRY	TUTKA BAY	4/17/80	82,671	17.57	NO	
PS 79	TUTKA BAY LAGOON CR	SWIMUP FRY	TUTKA BAY	5/09/80	199,608	42.11	NO	
PS 79	TUTKA BAY LAGOON CR	SWIMUP FRY	TUTKA BAY	5/08/80	150,700	31.79	NO	
PS 79	TUTKA BAY LAGOON CR	SWIMUP FRY	TUTKA BAY	5/07/80	173,963	36.70	NO	
PS 79	TUTKA BAY LAGOON CR	SWIMUP FRY	TUTKA BAY	4/15/80	20,465	4.35	NO	
PS 79	TUTKA BAY LAGOON CR	SWIMUP FRY	TUTKA BAY	4/13/80	31,558	6.71	NO	
PS 79	TUTKA BAY LAGOON CR	SWIMUP FRY	TUTKA BAY	4/12/80	25,801	5.48	NO	
PS 79	TUTKA BAY LAGOON CR	SWIMUP FRY	TUTKA BAY	4/11/80	16,459	3.49	NO	
PS 79	TUTKA BAY LAGOON CR	SWIMUP FRY	TUTKA BAY	5/19/80	30,000	6.38	LV	
PS 79	TUTKA BAY LAGOON CR	SWIMUP FRY	TUTKA BAY	5/15/80	98,690	20.82	LV	
PS 79	TUTKA BAY LAGOON CR	SWIMUP FRY	TUTKA BAY	6/03/80	5,327	5.07	NO	
PS 79	TUTKA BAY LAGOON CR	SWIMUP FRY	TUTKA BAY	6/04/80	2,360,469	930.22	RV	
H20 STOCKED TOTAL					6,228,987	2,348.50		
AGE TOTAL					6,792,844	2,467.45		
SPECIES TOTAL					6,792,844	2,467.45		
HATCHERY TOTAL					6,792,844	2,467.45		

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BR SP YR	ORIGIN	STAGE	WATER STOCKED	TRIP DATE	NUMBER STOCKED	TOTAL WT IN KG	MARKS	LTIND
RS 79	FRANCIS CREEK	SWIMUP FRY	LAKE NUNAVAUGALUK	2/15/80	225,000	45.36	NO	
RS 79	FRANCIS CREEK	SWIMUP FRY	LAKE NUNAVAUGALUK	3/01/80	675,000	136.07	NO	
H20 STOCKED TOTAL					900,000	181.43		
AGE TOTAL					900,000	181.43		
SPECIES TOTAL					900,000	181.43		
HATCHERY TOTAL					900,000	181.43		

SR	BR	YR	ORIGIN	STAGE	WATER STOCKED	TRIP DATE	NUMBER STOCKED	TOTAL WT IN KG	MARKS	WING
RS 79			TUSTUMENA LAKE	FINGERLINGS	CHINA POOL LAKE	5/22/80	532,650	81.56	NO	
H20 STOCKED TOTAL							532,650	81.56		
RS 79			TUSTUMENA LAKE	FINGERLINGS	GLACIER CREEK	6/13/80	559,000	123.20	NO	
RS 79			TUSTUMENA LAKE	FINGERLINGS	GLACIER CREEK	6/13/80	32,669	7.20	RV	
RS 79			TUSTUMENA LAKE	FINGERLINGS	GLACIER CREEK	6/13/80	559,000	123.20	NO	
RS 79			TUSTUMENA LAKE	FINGERLINGS	GLACIER CREEK	6/13/80	492,941	108.64	NO	
RS 79			TUSTUMENA LAKE	FINGERLINGS	GLACIER CREEK	6/13/80	526,500	118.24	NO	
RS 79			TUSTUMENA LAKE	FINGERLINGS	GLACIER CREEK	6/13/80	536,500	118.24	NO	
H20 STOCKED TOTAL							2,706,610	598.72		
RS 79			TUSTUMENA LAKE	FINGERLINGS	BEAR CREEK	6/12/80	655,971	141.33	NO	
RS 79			TUSTUMENA LAKE	FINGERLINGS	BEAR CREEK	6/12/80	642,299	138.38	NO	
RS 79			TUSTUMENA LAKE	FINGERLINGS	BEAR CREEK	6/12/80	554,460	119.46	NO	
RS 79			TUSTUMENA LAKE	FINGERLINGS	BEAR CREEK	6/12/80	613,744	132.24	NO	
RS 79			TUSTUMENA LAKE	FINGERLINGS	BEAR CREEK	6/12/80	32,758	7.06	LV	
H20 STOCKED TOTAL							2,499,232	538.47		
AGE TOTAL							5,738,492	1,218.75		
SPECIES TOTAL							5,738,492	1,218.75		
HATCHERY TOTAL							5,738,492	1,218.75		

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## FISH PLANTED IN 1980 BY CANNERY OR HATCHERY

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SR. YR.	ORIGIN	STAGE	WATER STOCKED	TRIP DATE	NUMBER STOCKED	TOTAL WT IN KG	MARKS	CWING
CS 79	SIWASH BAY	SAC FRY	CANNERY CREEK	5/07/80	54,026	19.14	NO	
CS 79	SIWASH BAY	SAC FRY	CANNERY CREEK	5/22/80	228,634	82.65	NO	
CS 79	SIWASH BAY	SAC FRY	CANNERY CREEK	4/15/80	53,517	19.14	NO	
CS 79	SIWASH BAY	SAC FRY	CANNERY CREEK	5/07/80	10,250	3.63	ADLV	
CS 79	SIWASH BAY	SAC FRY	CANNERY CREEK	4/28/80	116,422	41.64	NO	
H20 STOCKED TOTAL					462,849	166.20		
AGE TOTAL					462,849	166.20		
SPECIES TOTAL					462,849	166.20		
PS 79	JONAH CREEK	SAC FRY	HOB0 CREEK	4/28/80	31,261	5.82	AD	
PS 79	JONAH CREEK	SAC FRY	HOB0 CREEK	4/15/80	337,137	63.45	NO	
PS 79	JONAH CREEK	SAC FRY	HOB0 CREEK	4/28/80	462,624	86.06	NO	
PS 79	JONAH CREEK	SAC FRY	HOB0 CREEK	5/22/80	342,404	63.99	NO	
PS 79	JONAH CREEK	SAC FRY	HOB0 CREEK	5/07/80	517,286	96.33	NO	
H20 STOCKED TOTAL					1,690,712	315.65		
PS 79	CANNERY CREEK	SAC FRY	CANNERY CREEK	5/22/80	197,859	41.22	NO	
PS 79	CANNERY CREEK	SAC FRY	CANNERY CREEK	5/07/80	322,126	65.81	NO	
PS 79	CANNERY CREEK	SAC FRY	CANNERY CREEK	5/07/80	31,489	6.43	LVRV	
PS 79	CANNERY CREEK	SAC FRY	CANNERY CREEK	4/28/80	396,310	81.78	NO	
PS 79	CANNERY CREEK	SAC FRY	CANNERY CREEK	4/15/80	43,077	8.89	NO	
H20 STOCKED TOTAL					990,861	204.13		
AGE TOTAL					2,681,573	519.78		
SPECIES TOTAL					2,681,573	519.78		
HATCHERY TOTAL					3,144,422	685.98		

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FISH PLANTED IN 1980 BY CLEAR AFB HATCHERY

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BR	SP	YR	ORIGIN	STAGE	WATER STOCKED	TRIP DATE	NUMBER STOCKED	TOTAL WT IN KG	MARKS	LTWIND
CS	79	DELTA	CLEARWATER R.	SWIMUP FRY	FOSTER CREEK	5/01/80	27,054	8.73	NO	
CS	79	DELTA	CLEARWATER R.	SWIMUP FRY	FOSTER CREEK	5/04/80	39,130	11.47	NO	
CS	79	DELTA	CLEARWATER R.	SWIMUP FRY	FOSTER CREEK	5/02/80	33,326	9.97	NO	
CS	79	DELTA	CLEARWATER R.	SWIMUP FRY	FOSTER CREEK	6/01/80	1,852	.56	NO	
CS	79	DELTA	CLEARWATER R.	SWIMUP FRY	FOSTER CREEK	5/05/80	41,038	12.24	NO	
CS	79	DELTA	CLEARWATER R.	SWIMUP FRY	FOSTER CREEK	5/24/80	4,266	1.26	NO	
CS	79	DELTA	CLEARWATER R.	SWIMUP FRY	FOSTER CREEK	5/11/80	48,753	14.32	NO	
CS	79	DELTA	CLEARWATER R.	SWIMUP FRY	FOSTER CREEK	5/08/80	53,508	15.54	NO	
CS	79	DELTA	CLEARWATER R.	SWIMUP FRY	FOSTER CREEK	5/14/80	19,461	5.85	NO	
H20 STOCKED TOTAL							268,388	79.24		
AGE TOTAL							268,388	79.24		
SPECIES TOTAL							268,388	79.24		
HATCHERY TOTAL							268,388	79.24		

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FISH PLANTED IN 1980 BY CLEAR AFB HATCHERY

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SP	YR	BK	ORIGIN	STAGE	WATER STOCKED	TRIP DATE	NUMBER STOCKED	TOTAL WT IN KG	MARKS	CWING
FINAL TOTALS								50,468,401	45,423.49	

354 RECORDS TOTALED

1. The first part of the document is a list of names and titles, including the names of the authors and the titles of the papers. The names are listed in a column on the left, and the titles are listed in a column on the right. The names are listed in alphabetical order, and the titles are listed in the order in which they appear in the document.